Analytical Results Report TOC

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1. ECDMSAnalytical Results Report 7/27/2004

Catalog Number	Purchase Order Number	Lab ID	Catalog Submitter	ECDMS User ID
5030119	94420-04-Y390	TDI	Major, Drew - Concord, NH	r5nefo

Catalog Title	Dam Study - Merrimack Village
Lab Name:	TDI - Brooks International, Inc.
DEQ Project ID:	200350004
DEQ Project Title	NH, VT, MA - Contaminant Sampling to Facilitate Dam Removals/Habitat Restoration in New England

Notes, Symbols and Abbreviations Used
Based on the report options selected the report should be **printed in landscape mode**
Notes, Symbols and Abbreviations Used The following may appear before a reported result (e.g. < 1234). < - Less than symbol indicates that the actual result is less than the reported detection limit. > - Greater than symbol indicates that the actual result is greater than the reported result.
All results are reported as 3 significant digits.
All results are reported as parts per million (ppm), or percent, unless otherwise noted.

1. Integrity Report

Lab Receipt Date	06/02/2004	**Lab Approval Date**	

Catalog Problems
Sample IDs on paperwork received with samples did not match the IDs on the jars. Used the paperwork retreived from the ECDMS site to check samples in. The IDs on that paperwork did match the IDs on the jars.
Sample Problems
Received 5 samples that were broken. Transferred into new jars.

MVDTOC02:

MVDTOC03:

MVDTOC05:

MVDMOC02:

MVDMOC05:

Problem Resolution

2. Bulk Data

Sample Number	Sample Matrix	Sample Weight (grams)	Percent Moisture
MVDMOC01	Sediments	2000	28.8
MVDMOC02	Sediments	2000	22.3
MVDMOC03	Sediments	2000	35.4
MVDMOC04	Sediments	2000	12.6
MVDMOC05	Sediments	2000	52.9
MVDTOC01	Sediments	2000	
MVDTOC02	Sediments	2000	
MVDTOC03	Sediments	2000	
MVDTOC04	Sediments	2000	
MVDTOC05	Sediments	2000	

3. Soil/Sediment Parameters

Sample Number	Percent Total Organic Carbon	Percent Sand	Percent Silt	Percent Clay
MVDTOC01	0.420	95.4	3.62	0.960
MVDTOC02	1.94	97.3	2.08	0.600
MVDTOC03	0.0800	85.2	12.2	2.63
MVDTOC04	0.710	99.6	0.280	0.0900
MVDTOC05	< 0.000	68.7	24.8	6.56

4. Contaminant Concentrations

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
1,2,3,4-Tetrachlorobenzene						
	MVDMOC01	Sediments	< 0.000120	0.000120	< 0.0000854	0.0000854
	MVDMOC02	Sediments	< 0.000120	0.000120	< 0.0000933	0.0000933
	MVDMOC03	Sediments	< 0.000120	0.000120	< 0.0000775	0.0000775
	MVDMOC04	Sediments	< 0.000120	0.000120	< 0.000105	0.000105
	MVDMOC05	Sediments	< 0.000120	0.000120	< 0.0000565	0.0000565
1,2,4,5-Tetrachlorobenzene						
	MVDMOC01	Sediments	< 0.0000830	0.0000830	< 0.0000591	0.0000591
	MVDMOC02	Sediments	< 0.0000830	0.0000830	< 0.0000645	0.0000645
	MVDMOC03	Sediments	< 0.0000830	0.0000830	< 0.0000536	0.0000536
	MVDMOC04	Sediments	< 0.0000830	0.0000830	< 0.0000726	0.0000726
	MVDMOC05	Sediments	< 0.0000830	0.0000830	< 0.0000391	0.0000391
1,6,7-Trimethyl-naphthalene						
	MVDMOC01	Sediments	0.000300	0.000100	0.000214	0.0000712
	MVDMOC02	Sediments	0.000200	0.000100	0.000155	0.0000777
	MVDMOC03	Sediments	0.000800	0.000100	0.000517	0.0000646
	MVDMOC04	Sediments	< 0.000100	0.000100	< 0.0000874	0.0000874
	MVDMOC05	Sediments	0.00100	0.000100	0.000471	0.0000471
1-methylnaphthalene						
	MVDMOC01	Sediments	0.000700	0.000130	0.000498	0.0000925
	MVDMOC02	Sediments	0.000500	0.000130	0.000389	0.000101
	MVDMOC03	Sediments	0.00180	0.000130	0.00116	0.0000840
	MVDMOC04	Sediments	0.000200	0.000130	0.000175	0.000114
	MVDMOC05	Sediments	0.00350	0.000130	0.00165	0.0000612
1-methylphenanthrene						
	MVDMOC01	Sediments	0.00430	0.000199	0.00306	0.000142
	MVDMOC02	Sediments	0.00390	0.000200	0.00303	0.000155

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC03	Sediments	0.00980	0.000200	0.00633	0.000129
	MVDMOC04	Sediments	0.00150	0.000200	0.00131	0.000175
	MVDMOC05	Sediments	0.0220	0.000200	0.0104	0.0000941
2,6-dimethylnaphthalene						
	MVDMOC01	Sediments	0.000900	0.000199	0.000640	0.000142
	MVDMOC02	Sediments	0.000500	0.000200	0.000389	0.000155
	MVDMOC03	Sediments	0.00210	0.000200	0.00136	0.000129
	MVDMOC04	Sediments	< 0.000200	0.000200	< 0.000175	0.000175
	MVDMOC05	Sediments	0.00380	0.000200	0.00179	0.0000941
2-methylnaphthalene						
	MVDMOC01	Sediments	0.00110	0.000199	0.000783	0.000142
	MVDMOC02	Sediments	0.000700	0.000200	0.000544	0.000155
	MVDMOC03	Sediments	0.00280	0.000200	0.00181	0.000129
	MVDMOC04	Sediments	0.000300	0.000200	0.000262	0.000175
	MVDMOC05	Sediments	0.00490	0.000200	0.00231	0.0000941
Aldrin						
	MVDMOC01	Sediments	< 0.0000990	0.0000990	< 0.0000705	0.0000705
	MVDMOC02	Sediments	< 0.0000990	0.0000990	< 0.0000769	0.0000769
	MVDMOC03	Sediments	< 0.0000990	0.0000990	< 0.0000640	0.0000640
	MVDMOC04	Sediments	< 0.0000990	0.0000990	< 0.0000865	0.0000865
	MVDMOC05	Sediments	< 0.0000990	0.0000990	< 0.0000466	0.0000466
BHC (Total)						
	MVDMOC01	Sediments	< 0.000249	0.000249	< 0.000177	0.000177
	MVDMOC02	Sediments	< 0.000250	0.000250	< 0.000194	0.000194
	MVDMOC03	Sediments	< 0.000250	0.000250	< 0.000162	0.000162
	MVDMOC04	Sediments	< 0.000250	0.000250	< 0.000219	0.000219
	MVDMOC05	Sediments	< 0.000250	0.000250	< 0.000118	0.000118
Benzo(a)anthracene						
	MVDMOC01	Sediments	0.0299	0.000130	0.0213	0.0000925

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC02	Sediments	0.0278	0.000130	0.0216	0.000101
	MVDMOC03	Sediments	0.0605	0.000130	0.0391	0.0000840
	MVDMOC04	Sediments	0.00420	0.000130	0.00367	0.000114
	MVDMOC05	Sediments	0.156	0.000130	0.0734	0.0000612
C1-Fluoranthenes & Pyrenes						
	MVDMOC01	Sediments	0.0426	0.000389	0.0303	0.000277
	MVDMOC02	Sediments	0.0268	0.000390	0.0208	0.000303
	MVDMOC03	Sediments	0.0698	0.000390	0.0451	0.000252
	MVDMOC04	Sediments	0.00420	0.000390	0.00367	0.000341
	MVDMOC05	Sediments	0.164	0.000390	0.0772	0.000184
C1-Phenanthrenes & Anthracenes						
	MVDMOC01	Sediments	0.0237	0.000289	0.0169	0.000206
	MVDMOC02	Sediments	0.0166	0.000290	0.0129	0.000225
	MVDMOC03	Sediments	0.0541	0.000290	0.0350	0.000187
	MVDMOC04	Sediments	0.00460	0.000290	0.00402	0.000254
	MVDMOC05	Sediments	0.108	0.000290	0.0508	0.000136
C1-chrysenes						
	MVDMOC01	Sediments	0.0428	0.000349	0.0305	0.000248
	MVDMOC02	Sediments	0.0216	0.000350	0.0168	0.000272
	MVDMOC03	Sediments	0.0709	0.000350	0.0458	0.000226
	MVDMOC04	Sediments	0.00270	0.000350	0.00236	0.000306
	MVDMOC05	Sediments	0.150	0.000350	0.0706	0.000165
C1-dibenzothiophenes						
	MVDMOC01	Sediments	0.00250	0.000309	0.00178	0.000220
	MVDMOC02	Sediments	0.00200	0.000310	0.00155	0.000241
	MVDMOC03	Sediments	0.00620	0.000310	0.00401	0.000200
	MVDMOC04	Sediments	< 0.000310	0.000310	< 0.000271	0.000271
	MVDMOC05	Sediments	0.0133	0.000310	0.00626	0.000146
C1-fluorenes						

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC01	Sediments	0.00140	0.000389	0.000996	0.000277
	MVDMOC02	Sediments	0.00140	0.000390	0.00109	0.000303
	MVDMOC03	Sediments	0.00460	0.000390	0.00297	0.000252
	MVDMOC04	Sediments	< 0.000390	0.000390	< 0.000341	0.000341
	MVDMOC05	Sediments	0.00800	0.000390	0.00376	0.000184
C1-naphthalenes						
	MVDMOC01	Sediments	0.00140	0.000329	0.000996	0.000234
	MVDMOC02	Sediments	0.000900	0.000330	0.000699	0.000256
	MVDMOC03	Sediments	0.00360	0.000330	0.00233	0.000213
	MVDMOC04	Sediments	0.000400	0.000330	0.000350	0.000288
	MVDMOC05	Sediments	0.00650	0.000330	0.00306	0.000155
C2-Phenanthrenes & Anthracenes						
	MVDMOC01	Sediments	0.0158	0.000289	0.0112	0.000206
	MVDMOC02	Sediments	0.0107	0.000290	0.00832	0.000225
	MVDMOC03	Sediments	0.0392	0.000290	0.0253	0.000187
	MVDMOC04	Sediments	0.00170	0.000290	0.00149	0.000254
	MVDMOC05	Sediments	0.0694	0.000290	0.0327	0.000136
C2-chrysenes						
	MVDMOC01	Sediments	0.0100	0.000349	0.00712	0.000248
	MVDMOC02	Sediments	0.00820	0.000350	0.00637	0.000272
	MVDMOC03	Sediments	0.0284	0.000350	0.0183	0.000226
	MVDMOC04	Sediments	0.000600	0.000350	0.000524	0.000306
	MVDMOC05	Sediments	0.0598	0.000350	0.0281	0.000165
C2-dibenzothiophenes						
	MVDMOC01	Sediments	0.00310	0.000309	0.00221	0.000220
	MVDMOC02	Sediments	0.00170	0.000310	0.00132	0.000241
	MVDMOC03	Sediments	0.00690	0.000310	0.00446	0.000200
	MVDMOC04	Sediments	< 0.000310	0.000310	< 0.000271	0.000271
	MVDMOC05	Sediments	0.0143	0.000310	0.00673	0.000146

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
C2-fluorenes						
	MVDMOC01	Sediments	< 0.000389	0.000389	< 0.000277	0.000277
	MVDMOC02	Sediments	< 0.000390	0.000390	< 0.000303	0.000303
	MVDMOC03	Sediments	0.00850	0.000390	0.00549	0.000252
	MVDMOC04	Sediments	< 0.000390	0.000390	< 0.000341	0.000341
	MVDMOC05	Sediments	0.0106	0.000390	0.00499	0.000184
C2-naphthalenes						
	MVDMOC01	Sediments	0.00290	0.000349	0.00206	0.000248
	MVDMOC02	Sediments	0.00230	0.000350	0.00179	0.000272
	MVDMOC03	Sediments	0.00630	0.000350	0.00407	0.000226
	MVDMOC04	Sediments	< 0.000350	0.000350	< 0.000306	0.000306
	MVDMOC05	Sediments	0.00960	0.000350	0.00452	0.000165
C3-Phenanthrenes & Anthracenes						
	MVDMOC01	Sediments	0.00920	0.000289	0.00655	0.000206
	MVDMOC02	Sediments	0.00490	0.000290	0.00381	0.000225
	MVDMOC03	Sediments	0.0191	0.000290	0.0123	0.000187
	MVDMOC04	Sediments	0.000900	0.000290	0.000787	0.000254
	MVDMOC05	Sediments	0.0368	0.000290	0.0173	0.000136
C3-chrysenes						
	MVDMOC01	Sediments	< 0.000349	0.000349	< 0.000248	0.000248
	MVDMOC02	Sediments	0.00210	0.000350	0.00163	0.000272
	MVDMOC03	Sediments	0.00940	0.000350	0.00607	0.000226
	MVDMOC04	Sediments	< 0.000350	0.000350	< 0.000306	0.000306
	MVDMOC05	Sediments	0.0136	0.000350	0.00640	0.000165
C3-dibenzothiophenes						
	MVDMOC01	Sediments	0.00400	0.000309	0.00285	0.000220
	MVDMOC02	Sediments	0.00140	0.000310	0.00109	0.000241
	MVDMOC03	Sediments	0.00640	0.000310	0.00414	0.000200
	MVDMOC04	Sediments	< 0.000310	0.000310	< 0.000271	0.000271

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC05	Sediments	0.0161	0.000310	0.00758	0.000146
C3-fluorenes						
	MVDMOC01	Sediments	< 0.000389	0.000389	< 0.000277	0.000277
	MVDMOC02	Sediments	< 0.000390	0.000390	< 0.000303	0.000303
	MVDMOC03	Sediments	0.0187	0.000390	0.0121	0.000252
	MVDMOC04	Sediments	< 0.000390	0.000390	< 0.000341	0.000341
	MVDMOC05	Sediments	0.0130	0.000390	0.00612	0.000184
C3-naphthalenes						
	MVDMOC01	Sediments	0.00320	0.000349	0.00228	0.000248
	MVDMOC02	Sediments	0.00230	0.000350	0.00179	0.000272
	MVDMOC03	Sediments	0.00800	0.000350	0.00517	0.000226
	MVDMOC04	Sediments	< 0.000350	0.000350	< 0.000306	0.000306
	MVDMOC05	Sediments	0.0111	0.000350	0.00522	0.000165
C4-Phenanthrenes & Anthracenes						
	MVDMOC01	Sediments	< 0.000289	0.000289	< 0.000206	0.000206
	MVDMOC02	Sediments	< 0.000290	0.000290	< 0.000225	0.000225
	MVDMOC03	Sediments	< 0.000290	0.000290	< 0.000187	0.000187
	MVDMOC04	Sediments	< 0.000290	0.000290	< 0.000254	0.000254
	MVDMOC05	Sediments	0.0156	0.000290	0.00734	0.000136
C4-chrysenes						
	MVDMOC01	Sediments	< 0.000349	0.000349	< 0.000248	0.000248
	MVDMOC02	Sediments	0.00550	0.000350	0.00427	0.000272
	MVDMOC03	Sediments	0.0111	0.000350	0.00717	0.000226
	MVDMOC04	Sediments	< 0.000350	0.000350	< 0.000306	0.000306
	MVDMOC05	Sediments	0.0384	0.000350	0.0181	0.000165
C4-naphthalenes						
	MVDMOC01	Sediments	< 0.000349	0.000349	< 0.000248	0.000248
	MVDMOC02	Sediments	< 0.000350	0.000350	< 0.000272	0.000272
	MVDMOC03	Sediments	0.00620	0.000350	0.00401	0.000226

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC04	Sediments	< 0.000350	0.000350	< 0.000306	0.000306
	MVDMOC05	Sediments	0.0120	0.000350	0.00565	0.000165
DDMU						
	MVDMOC01	Sediments	< 0.0000740	0.0000740	< 0.0000527	0.0000527
	MVDMOC02	Sediments	< 0.0000740	0.0000740	< 0.0000575	0.0000575
	MVDMOC03	Sediments	< 0.0000740	0.0000740	< 0.0000478	0.0000478
	MVDMOC04	Sediments	< 0.0000740	0.0000740	< 0.0000647	0.0000647
	MVDMOC05	Sediments	< 0.0000740	0.0000740	< 0.0000348	0.0000348
Dibenz(a,h)anthracene						
	MVDMOC01	Sediments	0.0231	0.000150	0.0164	0.000107
	MVDMOC02	Sediments	0.00890	0.000150	0.00692	0.000117
	MVDMOC03	Sediments	0.0184	0.000150	0.0119	0.0000969
	MVDMOC04	Sediments	0.000700	0.000150	0.000612	0.000131
	MVDMOC05	Sediments	0.0567	0.000150	0.0267	0.0000706
HCB						
	MVDMOC01	Sediments	< 0.0000470	0.0000470	< 0.0000334	0.0000334
	MVDMOC02	Sediments	< 0.0000470	0.0000470	< 0.0000365	0.0000365
	MVDMOC03	Sediments	< 0.0000470	0.0000470	< 0.0000304	0.0000304
	MVDMOC04	Sediments	< 0.0000470	0.0000470	< 0.0000411	0.0000411
	MVDMOC05	Sediments	< 0.0000470	0.0000470	< 0.0000221	0.0000221
Heptachlor						
	MVDMOC01	Sediments	< 0.0000910	0.0000910	< 0.0000648	0.0000648
	MVDMOC02	Sediments	< 0.0000920	0.0000920	< 0.0000715	0.0000715
	MVDMOC03	Sediments	< 0.0000920	0.0000920	< 0.0000594	0.0000594
	MVDMOC04	Sediments	< 0.0000920	0.0000920	< 0.0000804	0.0000804
	MVDMOC05	Sediments	< 0.0000920	0.0000920	< 0.0000433	0.0000433
Pentachlorobenzene						
	MVDMOC01	Sediments	< 0.0000600	0.0000600	< 0.0000427	0.0000427
	MVDMOC02	Sediments	< 0.0000600	0.0000600	< 0.0000466	0.0000466

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC03	Sediments	< 0.0000600	0.0000600	< 0.0000388	0.0000388
	MVDMOC04	Sediments	< 0.0000600	0.0000600	< 0.0000525	0.0000525
	MVDMOC05	Sediments	< 0.0000600	0.0000600	< 0.0000282	0.0000282
Total Petroleum Hydrocarbons						
	MVDMOC01	Sediments	58.1	1.40	41.3	0.994
	MVDMOC02	Sediments	18.9	1.40	14.7	1.09
	MVDMOC03	Sediments	55.1	1.40	35.6	0.905
	MVDMOC04	Sediments	3.80	1.40	3.32	1.22
	MVDMOC05	Sediments	142	1.40	66.8	0.658
acenaphthalene						
	MVDMOC01	Sediments	0.00670	0.000189	0.00477	0.000134
	MVDMOC02	Sediments	0.00500	0.000190	0.00389	0.000148
	MVDMOC03	Sediments	0.0169	0.000190	0.0109	0.000123
	MVDMOC04	Sediments	0.000800	0.000190	0.000699	0.000166
	MVDMOC05	Sediments	0.0305	0.000190	0.0144	0.0000894
acenaphthene						
	MVDMOC01	Sediments	0.00110	0.000130	0.000783	0.0000925
	MVDMOC02	Sediments	0.00120	0.000130	0.000932	0.000101
	MVDMOC03	Sediments	0.00340	0.000130	0.00220	0.0000840
	MVDMOC04	Sediments	< 0.000130	0.000130	< 0.000114	0.000114
	MVDMOC05	Sediments	0.00640	0.000130	0.00301	0.0000612
alpha BHC						
	MVDMOC01	Sediments	< 0.0000910	0.0000910	< 0.0000648	0.0000648
	MVDMOC02	Sediments	< 0.0000910	0.0000910	< 0.0000707	0.0000707
	MVDMOC03	Sediments	< 0.0000910	0.0000910	< 0.0000588	0.0000588
	MVDMOC04	Sediments	< 0.0000910	0.0000910	< 0.0000796	0.0000796
	MVDMOC05	Sediments	< 0.0000910	0.0000910	< 0.0000428	0.0000428
alpha chlordane						
	MVDMOC01	Sediments	< 0.0000450	0.0000450	< 0.0000320	0.0000320

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC02	Sediments	0.0000880	0.0000450	0.0000684	0.0000350
	MVDMOC03	Sediments	0.000356	0.0000450	0.000230	0.0000291
	MVDMOC04	Sediments	< 0.0000450	0.0000450	< 0.0000393	0.0000393
	MVDMOC05	Sediments	< 0.0000450	0.0000450	< 0.0000212	0.0000212
anthracene						
	MVDMOC01	Sediments	0.00770	0.000189	0.00548	0.000134
	MVDMOC02	Sediments	0.00540	0.000190	0.00420	0.000148
	MVDMOC03	Sediments	0.0203	0.000190	0.0131	0.000123
	MVDMOC04	Sediments	0.00120	0.000190	0.00105	0.000166
	MVDMOC05	Sediments	0.0369	0.000190	0.0174	0.0000894
benzo(a)pyrene						
	MVDMOC01	Sediments	0.0415	0.000219	0.0295	0.000156
	MVDMOC02	Sediments	0.0348	0.000220	0.0270	0.000171
	MVDMOC03	Sediments	0.0815	0.000220	0.0527	0.000142
	MVDMOC04	Sediments	0.00510	0.000220	0.00446	0.000192
	MVDMOC05	Sediments	0.211	0.000220	0.0993	0.000104
benzo(b)fluoranthene						
	MVDMOC01	Sediments	0.0588	0.000289	0.0418	0.000206
	MVDMOC02	Sediments	0.0523	0.000290	0.0406	0.000225
	MVDMOC03	Sediments	0.106	0.000290	0.0685	0.000187
	MVDMOC04	Sediments	0.00780	0.000290	0.00682	0.000254
	MVDMOC05	Sediments	0.380	0.000290	0.179	0.000136
benzo(e)pyrene						
	MVDMOC01	Sediments	0.0314	0.000309	0.0223	0.000220
	MVDMOC02	Sediments	0.0279	0.000310	0.0217	0.000241
	MVDMOC03	Sediments	0.0571	0.000310	0.0369	0.000200
	MVDMOC04	Sediments	0.00400	0.000310	0.00350	0.000271
	MVDMOC05	Sediments	0.157	0.000310	0.0739	0.000146
benzo(g,h,i)perylene						

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC01	Sediments	0.0322	0.000140	0.0229	0.0000996
	MVDMOC02	Sediments	0.0273	0.000140	0.0212	0.000109
	MVDMOC03	Sediments	0.0592	0.000140	0.0382	0.0000905
	MVDMOC04	Sediments	0.00350	0.000140	0.00306	0.000122
	MVDMOC05	Sediments	0.156	0.000140	0.0734	0.0000659
benzo(k)fluoranthene						
	MVDMOC01	Sediments	0.0215	0.000229	0.0153	0.000163
	MVDMOC02	Sediments	0.0187	0.000230	0.0145	0.000179
	MVDMOC03	Sediments	0.0382	0.000230	0.0247	0.000149
	MVDMOC04	Sediments	0.00280	0.000230	0.00245	0.000201
	MVDMOC05	Sediments	0.107	0.000230	0.0504	0.000108
beta BHC						
	MVDMOC01	Sediments	< 0.0000660	0.0000660	< 0.0000470	0.0000470
	MVDMOC02	Sediments	< 0.0000660	0.0000660	< 0.0000513	0.0000513
	MVDMOC03	Sediments	< 0.0000660	0.0000660	< 0.0000426	0.0000426
	MVDMOC04	Sediments	< 0.0000660	0.0000660	< 0.0000577	0.0000577
	MVDMOC05	Sediments	< 0.0000660	0.0000660	< 0.0000311	0.0000311
biphenyl						
	MVDMOC01	Sediments	0.000600	0.000140	0.000427	0.0000996
	MVDMOC02	Sediments	0.000600	0.000140	0.000466	0.000109
	MVDMOC03	Sediments	0.00120	0.000140	0.000775	0.0000905
	MVDMOC04	Sediments	0.000300	0.000140	0.000262	0.000122
	MVDMOC05	Sediments	0.00200	0.000140	0.000941	0.0000659
chlorpyrifos						
	MVDMOC01	Sediments	0.000244	0.000104	0.000174	0.0000740
	MVDMOC02	Sediments	< 0.000105	0.000105	< 0.0000816	0.0000816
	MVDMOC03	Sediments	0.000227	0.000105	0.000147	0.0000678
	MVDMOC04	Sediments	< 0.000104	0.000104	< 0.0000909	0.0000909
	MVDMOC05	Sediments	0.000305	0.000104	0.000144	0.0000489

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
chrysene						
	MVDMOC01	Sediments	0.0485	0.000170	0.0345	0.000121
	MVDMOC02	Sediments	0.0450	0.000170	0.0350	0.000132
	MVDMOC03	Sediments	0.0913	0.000170	0.0590	0.000110
	MVDMOC04	Sediments	0.00590	0.000170	0.00516	0.000149
	MVDMOC05	Sediments	0.296	0.000170	0.139	0.0000800
cis-nonachlor						
	MVDMOC01	Sediments	< 0.0000650	0.0000650	< 0.0000463	0.0000463
	MVDMOC02	Sediments	< 0.0000660	0.0000660	< 0.0000513	0.0000513
	MVDMOC03	Sediments	0.0000690	0.0000660	0.0000446	0.0000426
	MVDMOC04	Sediments	< 0.0000660	0.0000660	< 0.0000577	0.0000577
	MVDMOC05	Sediments	0.0000760	0.0000660	0.0000358	0.0000311
delta BHC						
	MVDMOC01	Sediments	< 0.0000760	0.0000760	< 0.0000541	0.0000541
	MVDMOC02	Sediments	< 0.0000760	0.0000760	< 0.0000591	0.0000591
	MVDMOC03	Sediments	< 0.0000760	0.0000760	< 0.0000491	0.0000491
	MVDMOC04	Sediments	< 0.0000760	0.0000760	< 0.0000664	0.0000664
	MVDMOC05	Sediments	< 0.0000760	0.0000760	< 0.0000358	0.0000358
dibenzothiophene						
	MVDMOC01	Sediments	0.00200	0.000150	0.00142	0.000107
	MVDMOC02	Sediments	0.00140	0.000150	0.00109	0.000117
	MVDMOC03	Sediments	0.00390	0.000150	0.00252	0.0000969
	MVDMOC04	Sediments	0.000200	0.000150	0.000175	0.000131
	MVDMOC05	Sediments	0.0108	0.000150	0.00508	0.0000706
dieldrin						
	MVDMOC01	Sediments	< 0.0000650	0.0000650	< 0.0000463	0.0000463
	MVDMOC02	Sediments	< 0.0000650	0.0000650	< 0.0000505	0.0000505
	MVDMOC03	Sediments	0.000126	0.0000650	0.0000814	0.0000420
	MVDMOC04	Sediments	< 0.0000650	0.0000650	< 0.0000568	0.0000568

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC05	Sediments	0.000207	0.0000650	0.0000974	0.0000306
endosulfan I						
	MVDMOC01	Sediments	< 0.000111	0.000111	< 0.0000790	0.0000790
	MVDMOC02	Sediments	0.000112	0.000112	0.0000870	0.0000870
	MVDMOC03	Sediments	< 0.000112	0.000112	< 0.0000724	0.0000724
	MVDMOC04	Sediments	< 0.000112	0.000112	< 0.0000979	0.0000979
	MVDMOC05	Sediments	< 0.000112	0.000112	< 0.0000527	0.0000527
endosulfan II						
	MVDMOC01	Sediments	< 0.000103	0.000103	< 0.0000733	0.0000733
	MVDMOC02	Sediments	< 0.000103	0.000103	< 0.0000800	0.0000800
	MVDMOC03	Sediments	0.000175	0.000103	0.000113	0.0000665
	MVDMOC04	Sediments	< 0.000103	0.000103	< 0.0000900	0.0000900
	MVDMOC05	Sediments	< 0.000103	0.000103	< 0.0000485	0.0000485
endosulfan sulfate						
	MVDMOC01	Sediments	< 0.000103	0.000103	< 0.0000733	0.0000733
	MVDMOC02	Sediments	< 0.000103	0.000103	< 0.0000800	0.0000800
	MVDMOC03	Sediments	< 0.000103	0.000103	< 0.0000665	0.0000665
	MVDMOC04	Sediments	< 0.000103	0.000103	< 0.0000900	0.0000900
	MVDMOC05	Sediments	< 0.000103	0.000103	< 0.0000485	0.0000485
endrin						
	MVDMOC01	Sediments	< 0.000119	0.000119	< 0.0000847	0.0000847
	MVDMOC02	Sediments	< 0.000119	0.000119	< 0.0000925	0.0000925
	MVDMOC03	Sediments	< 0.000119	0.000119	< 0.0000769	0.0000769
	MVDMOC04	Sediments	< 0.000119	0.000119	< 0.000104	0.000104
	MVDMOC05	Sediments	< 0.000119	0.000119	< 0.0000560	0.0000560
fluoranthene						
	MVDMOC01	Sediments	0.0793	0.000209	0.0564	0.000149
	MVDMOC02	Sediments	0.0617	0.000210	0.0479	0.000163
	MVDMOC03	Sediments	0.140	0.000210	0.0905	0.000136

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC04	Sediments	0.0110	0.000210	0.00962	0.000184
	MVDMOC05	Sediments	0.332	0.000210	0.156	0.0000988
fluorene						
	MVDMOC01	Sediments	0.00240	0.000189	0.00171	0.000134
	MVDMOC02	Sediments	0.00190	0.000190	0.00148	0.000148
	MVDMOC03	Sediments	0.00610	0.000190	0.00394	0.000123
	MVDMOC04	Sediments	0.000300	0.000190	0.000262	0.000166
	MVDMOC05	Sediments	0.0118	0.000190	0.00555	0.0000894
gamma BHC						
	MVDMOC01	Sediments	< 0.0000460	0.0000460	< 0.0000327	0.0000327
	MVDMOC02	Sediments	< 0.0000460	0.0000460	< 0.0000357	0.0000357
	MVDMOC03	Sediments	< 0.0000460	0.0000460	< 0.0000297	0.0000297
	MVDMOC04	Sediments	< 0.0000460	0.0000460	< 0.0000402	0.0000402
	MVDMOC05	Sediments	< 0.0000460	0.0000460	< 0.0000216	0.0000216
gamma chlordane						
	MVDMOC01	Sediments	< 0.0000520	0.0000520	< 0.0000370	0.0000370
	MVDMOC02	Sediments	0.0000550	0.0000520	0.0000427	0.0000404
	MVDMOC03	Sediments	0.000153	0.0000520	0.0000989	0.0000336
	MVDMOC04	Sediments	< 0.0000520	0.0000520	< 0.0000455	0.0000455
	MVDMOC05	Sediments	< 0.0000520	0.0000520	< 0.0000245	0.0000245
heptachlor epoxide						
	MVDMOC01	Sediments	< 0.000182	0.000182	< 0.000130	0.000130
	MVDMOC02	Sediments	< 0.000183	0.000183	< 0.000142	0.000142
	MVDMOC03	Sediments	< 0.000183	0.000183	< 0.000118	0.000118
	MVDMOC04	Sediments	< 0.000183	0.000183	< 0.000160	0.000160
	MVDMOC05	Sediments	< 0.000183	0.000183	< 0.0000861	0.0000861
indeno(1,2,3-cd)pyrene						
	MVDMOC01	Sediments	0.0380	0.000279	0.0270	0.000199
	MVDMOC02	Sediments	0.0325	0.000280	0.0253	0.000218

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC03	Sediments	0.0681	0.000280	0.0440	0.000181
	MVDMOC04	Sediments	0.00380	0.000280	0.00332	0.000245
	MVDMOC05	Sediments	0.189	0.000280	0.0889	0.000132
mirex						
	MVDMOC01	Sediments	< 0.0000430	0.0000430	< 0.0000306	0.0000306
	MVDMOC02	Sediments	< 0.0000430	0.0000430	< 0.0000334	0.0000334
	MVDMOC03	Sediments	< 0.0000430	0.0000430	< 0.0000278	0.0000278
	MVDMOC04	Sediments	< 0.0000430	0.0000430	< 0.0000376	0.0000376
	MVDMOC05	Sediments	< 0.0000430	0.0000430	< 0.0000202	0.0000202
n-decane						
	MVDMOC01	Sediments	< 0.0110	0.0110	< 0.00781	0.00781
	MVDMOC02	Sediments	< 0.0110	0.0110	< 0.00855	0.00855
	MVDMOC03	Sediments	< 0.0110	0.0110	< 0.00711	0.00711
	MVDMOC04	Sediments	< 0.0110	0.0110	< 0.00961	0.00961
	MVDMOC05	Sediments	< 0.0110	0.0110	< 0.00517	0.00517
n-docosane						
	MVDMOC01	Sediments	0.0319	0.0130	0.0227	0.00923
	MVDMOC02	Sediments	0.0211	0.0130	0.0164	0.0101
	MVDMOC03	Sediments	0.0408	0.0130	0.0264	0.00840
	MVDMOC04	Sediments	< 0.0130	0.0130	< 0.0114	0.0114
	MVDMOC05	Sediments	0.0851	0.0130	0.0401	0.00611
n-dodecane						
	MVDMOC01	Sediments	< 0.00798	0.00798	< 0.00568	0.00568
	MVDMOC02	Sediments	< 0.00800	0.00800	< 0.00622	0.00622
	MVDMOC03	Sediments	< 0.00800	0.00800	< 0.00517	0.00517
	MVDMOC04	Sediments	< 0.00800	0.00800	< 0.00699	0.00699
	MVDMOC05	Sediments	< 0.00800	0.00800	< 0.00376	0.00376
n-dotriacontane						
	MVDMOC01	Sediments	0.138	0.0120	0.0984	0.00852

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC02	Sediments	0.0421	0.0120	0.0327	0.00933
	MVDMOC03	Sediments	0.112	0.0120	0.0725	0.00775
	MVDMOC04	Sediments	< 0.0120	0.0120	< 0.0105	0.0105
	MVDMOC05	Sediments	0.319	0.0120	0.150	0.00564
n-eicosane						
	MVDMOC01	Sediments	0.0426	0.0140	0.0303	0.00994
	MVDMOC02	Sediments	< 0.0140	0.0140	< 0.0109	0.0109
	MVDMOC03	Sediments	0.0408	0.0140	0.0264	0.00905
	MVDMOC04	Sediments	< 0.0140	0.0140	< 0.0122	0.0122
	MVDMOC05	Sediments	0.0426	0.0140	0.0200	0.00658
n-heneicosane						
	MVDMOC01	Sediments	0.0851	0.0140	0.0606	0.00994
	MVDMOC02	Sediments	0.0316	0.0140	0.0245	0.0109
	MVDMOC03	Sediments	0.0612	0.0140	0.0396	0.00905
	MVDMOC04	Sediments	< 0.0140	0.0140	< 0.0122	0.0122
	MVDMOC05	Sediments	0.149	0.0140	0.0701	0.00658
n-hentriacontane						
	MVDMOC01	Sediments	1.99	0.0130	1.42	0.00923
	MVDMOC02	Sediments	0.842	0.0130	0.654	0.0101
	MVDMOC03	Sediments	1.57	0.0130	1.02	0.00840
	MVDMOC04	Sediments	0.0417	0.0130	0.0364	0.0114
	MVDMOC05	Sediments	4.70	0.0130	2.21	0.00611
n-heptacosane						
	MVDMOC01	Sediments	1.11	0.0120	0.787	0.00852
	MVDMOC02	Sediments	0.368	0.0120	0.286	0.00933
	MVDMOC03	Sediments	0.694	0.0120	0.448	0.00775
	MVDMOC04	Sediments	0.0208	0.0120	0.0182	0.0105
	MVDMOC05	Sediments	1.84	0.0120	0.866	0.00564
n-heptadecane						

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC01	Sediments	0.0319	0.0110	0.0227	0.00781
	MVDMOC02	Sediments	0.0526	0.0110	0.0409	0.00855
	MVDMOC03	Sediments	0.0408	0.0110	0.0264	0.00711
	MVDMOC04	Sediments	< 0.0110	0.0110	< 0.00961	0.00961
	MVDMOC05	Sediments	0.149	0.0110	0.0701	0.00517
n-hexacosane						
	MVDMOC01	Sediments	0.0957	0.0120	0.0681	0.00852
	MVDMOC02	Sediments	0.0421	0.0120	0.0327	0.00933
	MVDMOC03	Sediments	0.0816	0.0120	0.0527	0.00775
	MVDMOC04	Sediments	< 0.0120	0.0120	< 0.0105	0.0105
	MVDMOC05	Sediments	0.170	0.0120	0.0801	0.00564
n-hexadecane						
	MVDMOC01	Sediments	< 0.0130	0.0130	< 0.00923	0.00923
	MVDMOC02	Sediments	< 0.0130	0.0130	< 0.0101	0.0101
	MVDMOC03	Sediments	< 0.0130	0.0130	< 0.00840	0.00840
	MVDMOC04	Sediments	< 0.0130	0.0130	< 0.0114	0.0114
	MVDMOC05	Sediments	0.0213	0.0130	0.0100	0.00611
n-nonacosane						
	MVDMOC01	Sediments	2.83	0.0110	2.01	0.00781
	MVDMOC02	Sediments	0.874	0.0110	0.679	0.00855
	MVDMOC03	Sediments	1.49	0.0110	0.963	0.00711
	MVDMOC04	Sediments	0.0417	0.0110	0.0364	0.00961
	MVDMOC05	Sediments	5.82	0.0110	2.74	0.00517
n-nonadecane						
	MVDMOC01	Sediments	0.0426	0.0110	0.0303	0.00781
	MVDMOC02	Sediments	0.0316	0.0110	0.0245	0.00855
	MVDMOC03	Sediments	0.0510	0.0110	0.0330	0.00711
	MVDMOC04	Sediments	< 0.0110	0.0110	< 0.00961	0.00961
	MVDMOC05	Sediments	0.0851	0.0110	0.0401	0.00517

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
n-octacosane						
	MVDMOC01	Sediments	0.181	0.0120	0.129	0.00852
	MVDMOC02	Sediments	0.0632	0.0120	0.0491	0.00933
	MVDMOC03	Sediments	0.133	0.0120	0.0857	0.00775
	MVDMOC04	Sediments	< 0.0120	0.0120	< 0.0105	0.0105
	MVDMOC05	Sediments	0.287	0.0120	0.135	0.00564
n-octadecane						
	MVDMOC01	Sediments	< 0.0130	0.0130	< 0.00923	0.00923
	MVDMOC02	Sediments	< 0.0130	0.0130	< 0.0101	0.0101
	MVDMOC03	Sediments	< 0.0130	0.0130	< 0.00840	0.00840
	MVDMOC04	Sediments	< 0.0130	0.0130	< 0.0114	0.0114
	MVDMOC05	Sediments	0.0213	0.0130	0.0100	0.00611
n-pentacosane						
	MVDMOC01	Sediments	0.372	0.0140	0.265	0.00994
	MVDMOC02	Sediments	0.168	0.0140	0.131	0.0109
	MVDMOC03	Sediments	0.337	0.0140	0.218	0.00905
	MVDMOC04	Sediments	0.0208	0.0140	0.0182	0.0122
	MVDMOC05	Sediments	0.723	0.0140	0.340	0.00658
n-pentadecane						
	MVDMOC01	Sediments	< 0.0170	0.0170	< 0.0121	0.0121
	MVDMOC02	Sediments	< 0.0170	0.0170	< 0.0132	0.0132
	MVDMOC03	Sediments	< 0.0170	0.0170	< 0.0110	0.0110
	MVDMOC04	Sediments	< 0.0170	0.0170	< 0.0149	0.0149
	MVDMOC05	Sediments	< 0.0170	0.0170	< 0.00800	0.00800
n-tetracosane						
	MVDMOC01	Sediments	0.0638	0.0110	0.0454	0.00781
	MVDMOC02	Sediments	0.0316	0.0110	0.0245	0.00855
	MVDMOC03	Sediments	0.0714	0.0110	0.0462	0.00711
	MVDMOC04	Sediments	< 0.0110	0.0110	< 0.00961	0.00961

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC05	Sediments	0.138	0.0110	0.0651	0.00517
n-tetradecane						
	MVDMOC01	Sediments	< 0.0140	0.0140	< 0.00994	0.00994
	MVDMOC02	Sediments	< 0.0140	0.0140	< 0.0109	0.0109
	MVDMOC03	Sediments	< 0.0140	0.0140	< 0.00905	0.00905
	MVDMOC04	Sediments	< 0.0140	0.0140	< 0.0122	0.0122
	MVDMOC05	Sediments	< 0.0140	0.0140	< 0.00658	0.00658
n-tetratriacontane						
	MVDMOC01	Sediments	0.202	0.0120	0.144	0.00852
	MVDMOC02	Sediments	0.0211	0.0120	0.0164	0.00933
	MVDMOC03	Sediments	0.0510	0.0120	0.0330	0.00775
	MVDMOC04	Sediments	< 0.0120	0.0120	< 0.0105	0.0105
	MVDMOC05	Sediments	0.213	0.0120	0.100	0.00564
n-triacontane						
	MVDMOC01	Sediments	0.160	0.0120	0.114	0.00852
	MVDMOC02	Sediments	0.0737	0.0120	0.0573	0.00933
	MVDMOC03	Sediments	0.153	0.0120	0.0989	0.00775
	MVDMOC04	Sediments	< 0.0120	0.0120	< 0.0105	0.0105
	MVDMOC05	Sediments	0.309	0.0120	0.145	0.00564
n-tricosane						
	MVDMOC01	Sediments	0.149	0.0130	0.106	0.00923
	MVDMOC02	Sediments	0.0737	0.0130	0.0573	0.0101
	MVDMOC03	Sediments	0.163	0.0130	0.105	0.00840
	MVDMOC04	Sediments	< 0.0130	0.0130	< 0.0114	0.0114
	MVDMOC05	Sediments	0.415	0.0130	0.195	0.00611
n-tridecane						
	MVDMOC01	Sediments	< 0.0130	0.0130	< 0.00923	0.00923
	MVDMOC02	Sediments	< 0.0130	0.0130	< 0.0101	0.0101
	MVDMOC03	Sediments	< 0.0130	0.0130	< 0.00840	0.00840

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC04	Sediments	< 0.0130	0.0130	< 0.0114	0.0114
	MVDMOC05	Sediments	< 0.0130	0.0130	< 0.00611	0.00611
n-tritriacontane						
	MVDMOC01	Sediments	0.511	0.00997	0.363	0.00710
	MVDMOC02	Sediments	0.295	0.0100	0.229	0.00777
	MVDMOC03	Sediments	0.469	0.0100	0.303	0.00646
	MVDMOC04	Sediments	0.0104	0.00999	0.00911	0.00874
	MVDMOC05	Sediments	1.07	0.00999	0.506	0.00470
n-undecane						
	MVDMOC01	Sediments	< 0.0120	0.0120	< 0.00852	0.00852
	MVDMOC02	Sediments	< 0.0120	0.0120	< 0.00933	0.00933
	MVDMOC03	Sediments	< 0.0120	0.0120	< 0.00775	0.00775
	MVDMOC04	Sediments	< 0.0120	0.0120	< 0.0105	0.0105
	MVDMOC05	Sediments	< 0.0120	0.0120	< 0.00564	0.00564
naphthalene						
	MVDMOC01	Sediments	0.00210	0.000170	0.00149	0.000121
	MVDMOC02	Sediments	0.00170	0.000170	0.00132	0.000132
	MVDMOC03	Sediments	0.00560	0.000170	0.00362	0.000110
	MVDMOC04	Sediments	0.000500	0.000170	0.000437	0.000149
	MVDMOC05	Sediments	0.00920	0.000170	0.00433	0.0000800
o,p'-DDD						
	MVDMOC01	Sediments	0.000244	0.0000720	0.000174	0.0000512
	MVDMOC02	Sediments	0.0000990	0.0000720	0.0000769	0.0000560
	MVDMOC03	Sediments	0.000435	0.0000720	0.000281	0.0000465
	MVDMOC04	Sediments	< 0.0000720	0.0000720	< 0.0000629	0.0000629
	MVDMOC05	Sediments	0.000566	0.0000720	0.000266	0.0000339
o,p'-DDE						
	MVDMOC01	Sediments	< 0.0000490	0.0000490	< 0.0000349	0.0000349
	MVDMOC02	Sediments	< 0.0000490	0.0000490	< 0.0000381	0.0000381

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC03	Sediments	0.0000690	0.0000490	0.0000446	0.0000317
	MVDMOC04	Sediments	< 0.0000490	0.0000490	< 0.0000428	0.0000428
	MVDMOC05	Sediments	0.0000650	0.0000490	0.0000306	0.0000231
o,p'-DDT						
	MVDMOC01	Sediments	< 0.0000960	0.0000960	< 0.0000683	0.0000683
	MVDMOC02	Sediments	< 0.0000960	0.0000960	< 0.0000746	0.0000746
	MVDMOC03	Sediments	< 0.0000960	0.0000960	< 0.0000620	0.0000620
	MVDMOC04	Sediments	< 0.0000960	0.0000960	< 0.0000839	0.0000839
	MVDMOC05	Sediments	0.000120	0.0000960	0.0000565	0.0000452
oxychlordane						
	MVDMOC01	Sediments	< 0.0000510	0.0000510	< 0.0000363	0.0000363
	MVDMOC02	Sediments	< 0.0000510	0.0000510	< 0.0000396	0.0000396
	MVDMOC03	Sediments	< 0.0000510	0.0000510	< 0.0000330	0.0000330
	MVDMOC04	Sediments	< 0.0000510	0.0000510	< 0.0000446	0.0000446
	MVDMOC05	Sediments	< 0.0000510	0.0000510	< 0.0000240	0.0000240
p,p'-DDD						
	MVDMOC01	Sediments	0.000166	0.000111	0.000118	0.0000790
	MVDMOC02	Sediments	0.000132	0.000111	0.000103	0.0000863
	MVDMOC03	Sediments	0.000378	0.000111	0.000244	0.0000717
	MVDMOC04	Sediments	< 0.000111	0.000111	< 0.0000970	0.0000970
	MVDMOC05	Sediments	0.000588	0.000111	0.000277	0.0000522
p,p'-DDE						
	MVDMOC01	Sediments	0.000644	0.0000380	0.000458	0.0000270
	MVDMOC02	Sediments	0.000264	0.0000380	0.000205	0.0000295
	MVDMOC03	Sediments	0.00147	0.0000380	0.000947	0.0000246
	MVDMOC04	Sediments	< 0.0000380	0.0000380	< 0.0000332	0.0000332
	MVDMOC05	Sediments	0.00217	0.0000380	0.00102	0.0000179
p,p'-DDT						
	MVDMOC01	Sediments	0.0000890	0.0000770	0.0000633	0.0000548

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC02	Sediments	0.0000990	0.0000770	0.0000769	0.0000598
	MVDMOC03	Sediments	0.000275	0.0000770	0.000178	0.0000497
	MVDMOC04	Sediments	< 0.0000770	0.0000770	< 0.0000673	0.0000673
	MVDMOC05	Sediments	0.000621	0.0000770	0.000292	0.0000362
pentachloro-anisole						
	MVDMOC01	Sediments	< 0.0000600	0.0000600	< 0.0000427	0.0000427
	MVDMOC02	Sediments	< 0.0000600	0.0000600	< 0.0000466	0.0000466
	MVDMOC03	Sediments	< 0.0000600	0.0000600	< 0.0000388	0.0000388
	MVDMOC04	Sediments	< 0.0000600	0.0000600	< 0.0000525	0.0000525
	MVDMOC05	Sediments	0.0000980	0.0000600	0.0000461	0.0000282
perylene						
	MVDMOC01	Sediments	0.0129	0.00138	0.00918	0.000979
	MVDMOC02	Sediments	0.00900	0.00138	0.00699	0.00107
	MVDMOC03	Sediments	0.0282	0.00138	0.0182	0.000892
	MVDMOC04	Sediments	< 0.00138	0.00138	< 0.00121	0.00121
	MVDMOC05	Sediments	0.0483	0.00138	0.0227	0.000649
phenanthrene						
	MVDMOC01	Sediments	0.0376	0.000140	0.0268	0.0000996
	MVDMOC02	Sediments	0.0294	0.000140	0.0228	0.000109
	MVDMOC03	Sediments	0.0726	0.000140	0.0469	0.0000905
	MVDMOC04	Sediments	0.00590	0.000140	0.00516	0.000122
	MVDMOC05	Sediments	0.175	0.000140	0.0824	0.0000659
phytane						
	MVDMOC01	Sediments	0.0213	0.0120	0.0151	0.00852
	MVDMOC02	Sediments	< 0.0120	0.0120	< 0.00933	0.00933
	MVDMOC03	Sediments	0.0204	0.0120	0.0132	0.00775
	MVDMOC04	Sediments	< 0.0120	0.0120	< 0.0105	0.0105
	MVDMOC05	Sediments	0.0532	0.0120	0.0250	0.00564
pristane						

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC01	Sediments	0.0426	0.0120	0.0303	0.00852
	MVDMOC02	Sediments	< 0.0120	0.0120	< 0.00933	0.00933
	MVDMOC03	Sediments	< 0.0120	0.0120	< 0.00775	0.00775
	MVDMOC04	Sediments	< 0.0120	0.0120	< 0.0105	0.0105
	MVDMOC05	Sediments	0.0213	0.0120	0.0100	0.00564
pyrene						
	MVDMOC01	Sediments	0.0646	0.000189	0.0460	0.000134
	MVDMOC02	Sediments	0.0526	0.000190	0.0409	0.000148
	MVDMOC03	Sediments	0.114	0.000190	0.0737	0.000123
	MVDMOC04	Sediments	0.00910	0.000190	0.00796	0.000166
	MVDMOC05	Sediments	0.276	0.000190	0.130	0.0000894
toxaphene						
	MVDMOC01	Sediments	< 0.00444	0.00444	< 0.00316	0.00316
	MVDMOC02	Sediments	< 0.00446	0.00446	< 0.00346	0.00346
	MVDMOC03	Sediments	< 0.00446	0.00446	< 0.00288	0.00288
	MVDMOC04	Sediments	< 0.00445	0.00445	< 0.00389	0.00389
	MVDMOC05	Sediments	< 0.00445	0.00445	< 0.00210	0.00210
trans-nonachlor						
	MVDMOC01	Sediments	0.000122	0.0000390	0.0000868	0.0000278
	MVDMOC02	Sediments	< 0.0000390	0.0000390	< 0.0000303	0.0000303
	MVDMOC03	Sediments	0.000195	0.0000390	0.000126	0.0000252
	MVDMOC04	Sediments	< 0.0000390	0.0000390	< 0.0000341	0.0000341
	MVDMOC05	Sediments	0.000338	0.0000390	0.000159	0.0000184

5. Procedural Blanks

Analyte	Lab Sample Number	Lab Sample Matrix	Result Total UG	** BEC (ppm/%)	Basis
1,2,3,4-Tetrachlorobenzene					
	ENV936A	Soil/Sediment	0.00180	< 0.000120	Dry
1,2,4,5-Tetrachlorobenzene					
	ENV936A	Soil/Sediment	0.00120	< 0.0000830	Dry
1,6,7-Trimethyl-naphthalene					
	ENV936A	Soil/Sediment	0.00150	< 0.000100	Dry
1-methylnaphthalene					
	ENV936A	Soil/Sediment	0.00300	0.000200	Dry
1-methylphenanthrene					
	ENV936A	Soil/Sediment	0.00300	< 0.000200	Dry
2,6-dimethylnaphthalene					
	ENV936A	Soil/Sediment	0.00300	< 0.000200	Dry
2-methylnaphthalene					
	ENV936A	Soil/Sediment	0.00300	< 0.000200	Dry
Aldrin					
	ENV936A	Soil/Sediment	0.00150	< 0.0000990	Dry
BHC (Total)					
	ENV936A	Soil/Sediment	0.00370	< 0.000250	Dry
Benzo(a)anthracene					
	ENV936A	Soil/Sediment	0.00190	< 0.000130	Dry
C1-Fluoranthenes & Pyrenes					
	ENV936A	Soil/Sediment	0.00580	< 0.000390	Dry
C1-Phenanthrenes & Anthracenes					
	ENV936A	Soil/Sediment	0.00430	< 0.000290	Dry
C1-chrysenes					
	ENV936A	Soil/Sediment	0.00520	< 0.000350	Dry
C1-dibenzothiophenes					
	ENV936A	Soil/Sediment	0.00460	< 0.000310	Dry
C1-fluorenes					
	ENV936A	Soil/Sediment	0.00580	< 0.000390	Dry

Analyte	Lab Sample Number	Lab Sample Matrix	Result Total UG	** BEC (ppm/%)	Basis
C1-naphthalenes					
	ENV936A	Soil/Sediment	0.00490	< 0.000330	Dry
C2-Phenanthrenes & Anthracenes					
	ENV936A	Soil/Sediment	0.00430	< 0.000290	Dry
C2-chrysenes					
	ENV936A	Soil/Sediment	0.00520	< 0.000350	Dry
C2-dibenzothiophenes					
	ENV936A	Soil/Sediment	0.00460	< 0.000310	Dry
C2-fluorenes					
	ENV936A	Soil/Sediment	0.00580	< 0.000390	Dry
C2-naphthalenes					
	ENV936A	Soil/Sediment	0.00520	< 0.000350	Dry
C3-Phenanthrenes & Anthracenes					
	ENV936A	Soil/Sediment	0.00430	< 0.000290	Dry
C3-chrysenes					
	ENV936A	Soil/Sediment	0.00520	< 0.000350	Dry
C3-dibenzothiophenes					
	ENV936A	Soil/Sediment	0.00460	< 0.000310	Dry
C3-fluorenes					
	ENV936A	Soil/Sediment	0.00580	< 0.000390	Dry
C3-naphthalenes					
	ENV936A	Soil/Sediment	0.00520	< 0.000350	Dry
C4-Phenanthrenes & Anthracenes					
	ENV936A	Soil/Sediment	0.00430	< 0.000290	Dry
C4-chrysenes					
	ENV936A	Soil/Sediment	0.00520	< 0.000350	Dry
C4-naphthalenes					
	ENV936A	Soil/Sediment	0.00520	< 0.000350	Dry
DDMU					
	ENV936A	Soil/Sediment	0.00110	< 0.0000740	Dry
Dibenz(a,h)anthracene					
	ENV936A	Soil/Sediment	0.00230	< 0.000150	Dry
HCB					

Analyte	Lab Sample Number	Lab Sample Matrix	Result Total UG	** BEC (ppm/%)	Basis
	ENV936A	Soil/Sediment	0.000700	< 0.0000470	Dry
Heptachlor					
	ENV936A	Soil/Sediment	0.00140	< 0.0000920	Dry
Pentachlorobenzene					
	ENV936A	Soil/Sediment	0.000900	< 0.0000600	Dry
Total Petroleum Hydrocarbons					
	ENV936A	Soil/Sediment	21.0	< 1.40	Dry
acenaphthalene					
	ENV936A	Soil/Sediment	0.00280	< 0.000190	Dry
acenaphthene					
	ENV936A	Soil/Sediment	0.00190	< 0.000130	Dry
alpha BHC					
	ENV936A	Soil/Sediment	0.00140	< 0.0000910	Dry
alpha chlordane					
	ENV936A	Soil/Sediment	0.000700	< 0.0000450	Dry
anthracene					
	ENV936A	Soil/Sediment	0.00280	< 0.000190	Dry
benzo(a)pyrene					
	ENV936A	Soil/Sediment	0.00330	< 0.000220	Dry
benzo(b)fluoranthene					
	ENV936A	Soil/Sediment	0.00430	< 0.000290	Dry
benzo(e)pyrene					
	ENV936A	Soil/Sediment	0.00460	< 0.000310	Dry
benzo(g,h,i)perylene					
	ENV936A	Soil/Sediment	0.00210	< 0.000140	Dry
benzo(k)fluoranthene					
	ENV936A	Soil/Sediment	0.00350	< 0.000230	Dry
beta BHC					
	ENV936A	Soil/Sediment	0.00100	< 0.0000660	Dry
biphenyl					
	ENV936A	Soil/Sediment	0.00450	0.000300	Dry
chlorpyrifos					
	ENV936A	Soil/Sediment	0.00160	< 0.000105	Dry

Analyte	Lab Sample Number	Lab Sample Matrix	Result Total UG	** BEC (ppm/%)	Basis
chrysene					
	ENV936A	Soil/Sediment	0.00250	< 0.000170	Dry
cis-nonachlor					
	ENV936A	Soil/Sediment	0.00100	< 0.0000660	Dry
delta BHC					
	ENV936A	Soil/Sediment	0.00110	< 0.0000760	Dry
dibenzothiophene					
	ENV936A	Soil/Sediment	0.00230	< 0.000150	Dry
dieldrin					
	ENV936A	Soil/Sediment	0.00100	< 0.0000650	Dry
endosulfan I					
	ENV936A	Soil/Sediment	0.00170	< 0.000112	Dry
endosulfan II					
	ENV936A	Soil/Sediment	0.00150	< 0.000103	Dry
endosulfan sulfate					
	ENV936A	Soil/Sediment	0.00150	< 0.000103	Dry
endrin					
	ENV936A	Soil/Sediment	0.00180	< 0.000119	Dry
fluoranthene					
	ENV936A	Soil/Sediment	0.00320	< 0.000210	Dry
fluorene					
	ENV936A	Soil/Sediment	0.00280	< 0.000190	Dry
gamma BHC					
	ENV936A	Soil/Sediment	0.000700	< 0.0000460	Dry
gamma chlordane					
	ENV936A	Soil/Sediment	0.000800	< 0.0000520	Dry
heptachlor epoxide					
	ENV936A	Soil/Sediment	0.00270	< 0.000183	Dry
indeno(1,2,3-cd)pyrene					
	ENV936A	Soil/Sediment	0.00420	< 0.000280	Dry
mirex					
	ENV936A	Soil/Sediment	0.000600	< 0.0000430	Dry
n-decane					

Analyte	Lab Sample Number	Lab Sample Matrix	Result Total UG	** BEC (ppm/%)	Basis
	ENV936A	Soil/Sediment	0.165	< 0.0110	Dry
n-docosane					
	ENV936A	Soil/Sediment	0.195	< 0.0130	Dry
n-dodecane					
	ENV936A	Soil/Sediment	0.120	< 0.00800	Dry
n-dotriacontane					
	ENV936A	Soil/Sediment	0.180	< 0.0120	Dry
n-eicosane					
	ENV936A	Soil/Sediment	0.210	< 0.0140	Dry
n-heneicosane					
	ENV936A	Soil/Sediment	0.210	< 0.0140	Dry
n-hentriacontane					
	ENV936A	Soil/Sediment	0.195	< 0.0130	Dry
n-heptacosane					
	ENV936A	Soil/Sediment	0.180	< 0.0120	Dry
n-heptadecane					
	ENV936A	Soil/Sediment	0.165	< 0.0110	Dry
n-hexacosane					
	ENV936A	Soil/Sediment	0.180	< 0.0120	Dry
n-hexadecane					
	ENV936A	Soil/Sediment	0.195	< 0.0130	Dry
n-nonacosane					
	ENV936A	Soil/Sediment	0.165	< 0.0110	Dry
n-nonadecane					
	ENV936A	Soil/Sediment	0.165	< 0.0110	Dry
n-octacosane					
	ENV936A	Soil/Sediment	0.180	< 0.0120	Dry
n-octadecane					
	ENV936A	Soil/Sediment	0.195	< 0.0130	Dry
n-pentacosane					
	ENV936A	Soil/Sediment	0.210	< 0.0140	Dry
n-pentadecane					
	ENV936A	Soil/Sediment	0.255	< 0.0170	Dry

Analyte	Lab Sample Number	Lab Sample Matrix	Result Total UG	** BEC (ppm/%)	Basis
n-tetracosane					
	ENV936A	Soil/Sediment	0.165	< 0.0110	Dry
n-tetradecane					
	ENV936A	Soil/Sediment	0.210	< 0.0140	Dry
n-tetratriacontane					
	ENV936A	Soil/Sediment	0.180	< 0.0120	Dry
n-triacontane					
	ENV936A	Soil/Sediment	0.180	< 0.0120	Dry
n-tricosane					
	ENV936A	Soil/Sediment	0.195	< 0.0130	Dry
n-tridecane					
	ENV936A	Soil/Sediment	0.195	< 0.0130	Dry
n-tritriacontane					
	ENV936A	Soil/Sediment	0.150	< 0.0100	Dry
n-undecane					
	ENV936A	Soil/Sediment	0.180	< 0.0120	Dry
naphthalene					
	ENV936A	Soil/Sediment	0.00450	0.000300	Dry
o,p'-DDD					
	ENV936A	Soil/Sediment	0.00110	< 0.0000720	Dry
o,p'-DDE					
	ENV936A	Soil/Sediment	0.000700	< 0.0000490	Dry
o,p'-DDT					
	ENV936A	Soil/Sediment	0.00140	< 0.0000960	Dry
oxychlordane					
	ENV936A	Soil/Sediment	0.000800	< 0.0000510	Dry
p,p'-DDD					
	ENV936A	Soil/Sediment	0.00170	< 0.000111	Dry
p,p'-DDE					
	ENV936A	Soil/Sediment	0.000600	< 0.0000380	Dry
p,p'-DDT					
	ENV936A	Soil/Sediment	0.00120	< 0.0000770	Dry
pentachloro-anisole					

Analyte	Lab Sample Number	Lab Sample Matrix	Result Total UG	** BEC (ppm/%)	Basis
	ENV936A	Soil/Sediment	0.000900	< 0.0000600	Dry
perylene					
	ENV936A	Soil/Sediment	0.0207	< 0.00138	Dry
phenanthrene					
	ENV936A	Soil/Sediment	0.00300	0.000200	Dry
phytane					
	ENV936A	Soil/Sediment	0.180	< 0.0120	Dry
pristane					
	ENV936A	Soil/Sediment	0.180	< 0.0120	Dry
pyrene					
	ENV936A	Soil/Sediment	0.00280	< 0.000190	Dry
toxaphene					
	ENV936A	Soil/Sediment	0.0668	< 0.00446	Dry
trans-nonachlor					
	ENV936A	Soil/Sediment	0.000600	< 0.0000390	Dry

** Blank Equivalent Concentration

6. Duplicates

Analyte	Sample Number	Sample Matrix	Basis	Initial Result (ppm/%)	Duplicate Result (ppm/%)	Average	Relative Percent Diff.
% Moisture							
	MVDMOC03	Sediments	Percent	35.4	35.4	35.4	0.000
1,2,3,4-Tetrachlorobenzene							
	MVDMOC03	Sediments	Dry	< 0.000120	< 0.000120	0.0000600	0.000
1,2,4,5-Tetrachlorobenzene							
	MVDMOC03	Sediments	Dry	< 0.0000830	< 0.0000830	0.0000415	0.000
1,6,7-Trimethyl-naphthalene							
	MVDMOC03	Sediments	Dry	0.000800	0.000800	0.000800	0.000
1-methylnaphthalene							
	MVDMOC03	Sediments	Dry	0.00180	0.00190	0.00185	5.41
1-methylphenanthrene							
	MVDMOC03	Sediments	Dry	0.00980	0.0105	0.0102	6.90
2,6-dimethylnaphthalene							
	MVDMOC03	Sediments	Dry	0.00210	0.00210	0.00210	0.000
2-methylnaphthalene							
	MVDMOC03	Sediments	Dry	0.00280	0.00270	0.00275	3.64
Aldrin							
	MVDMOC03	Sediments	Dry	< 0.0000990	< 0.0000990	0.0000495	0.000
BHC (Total)							
	MVDMOC03	Sediments	Dry	< 0.000250	< 0.000249	0.000125	0.400
Benzo(a)anthracene							
	MVDMOC03	Sediments	Dry	0.0605	0.0617	0.0611	1.96
C1-Fluoranthenes & Pyrenes							
	MVDMOC03	Sediments	Dry	0.0698	0.0683	0.0690	2.17
C1-Phenanthrenes & Anthracenes							
	MVDMOC03	Sediments	Dry	0.0541	0.0518	0.0530	4.34
C1-chrysenes							
	MVDMOC03	Sediments	Dry	0.0709	0.0730	0.0720	2.92
C1-dibenzothiophenes							
	MVDMOC03	Sediments	Dry	0.00620	0.00620	0.00620	0.000

Analyte	Sample Number	Sample Matrix	Basis	Initial Result (ppm/%)	Duplicate Result (ppm/%)	Average	Relative Percent Diff.
C1-fluorenes							
	MVDMOC03	Sediments	Dry	0.00460	0.00470	0.00465	2.15
C1-naphthalenes							
	MVDMOC03	Sediments	Dry	0.00360	0.00360	0.00360	0.000
C2-Phenanthrenes & Anthracenes							
	MVDMOC03	Sediments	Dry	0.0392	0.0400	0.0396	2.02
C2-chrysenes							
	MVDMOC03	Sediments	Dry	0.0284	0.0292	0.0288	2.78
C2-dibenzothiophenes							
	MVDMOC03	Sediments	Dry	0.00690	0.00650	0.00670	5.97
C2-fluorenes							
	MVDMOC03	Sediments	Dry	0.00850	0.00830	0.00840	2.38
C2-naphthalenes							
	MVDMOC03	Sediments	Dry	0.00630	0.00630	0.00630	0.000
C3-Phenanthrenes & Anthracenes							
	MVDMOC03	Sediments	Dry	0.0191	0.0192	0.0192	0.520
C3-chrysenes							
	MVDMOC03	Sediments	Dry	0.00940	0.00890	0.00915	5.46
C3-dibenzothiophenes							
	MVDMOC03	Sediments	Dry	0.00640	0.00610	0.00625	4.80
C3-fluorenes							
	MVDMOC03	Sediments	Dry	0.0187	0.0187	0.0187	0.000
C3-naphthalenes							
	MVDMOC03	Sediments	Dry	0.00800	0.00780	0.00790	2.53
C4-Phenanthrenes & Anthracenes							
	MVDMOC03	Sediments	Dry	< 0.000290	< 0.000289	0.000145	0.350
C4-chrysenes							
	MVDMOC03	Sediments	Dry	0.0111	0.0110	0.0110	0.900
C4-naphthalenes							
	MVDMOC03	Sediments	Dry	0.00620	0.00670	0.00645	7.75
DDMU							
	MVDMOC03	Sediments	Dry	< 0.0000740	< 0.0000740	0.0000370	0.000

Analyte	Sample Number	Sample Matrix	Basis	Initial Result (ppm/%)	Duplicate Result (ppm/%)	Average	Relative Percent Diff.
Dibenz(a,h)anthracene							
	MVDMOC03	Sediments	Dry	0.0184	0.0189	0.0186	2.68
Grain Size-Clay							
	MVDTOC04	Sediments	Percent	0.0900	0.0500	0.0700	57.1
Grain Size-Sand							
	MVDTOC04	Sediments	Percent	99.6	98.7	99.2	0.940
Grain Size-Silt							
	MVDTOC04	Sediments	Percent	0.280	0.240	0.260	15.4
HCB							
	MVDMOC03	Sediments	Dry	< 0.0000470	< 0.0000470	0.0000235	0.000
Heptachlor							
	MVDMOC03	Sediments	Dry	< 0.0000920	< 0.0000910	0.0000458	1.09
Pentachlorobenzene							
	MVDMOC03	Sediments	Dry	< 0.0000600	< 0.0000600	0.0000300	0.000
Tot. Organic Carbon							
	MVDTOC04	Sediments	Percent	0.710	0.690	0.700	2.86
Total Petroleum Hydrocarbons							
	MVDMOC03	Sediments	Dry	55.1	57.5	56.3	4.26
acenaphthalene							
	MVDMOC03	Sediments	Dry	0.0169	0.0160	0.0164	5.47
acenaphthene							
	MVDMOC03	Sediments	Dry	0.00340	0.00340	0.00340	0.000
alpha BHC							
	MVDMOC03	Sediments	Dry	< 0.0000910	< 0.0000910	0.0000455	0.000
alpha chlordane							
	MVDMOC03	Sediments	Dry	0.000356	0.000341	0.000348	4.30
anthracene							
	MVDMOC03	Sediments	Dry	0.0203	0.0191	0.0197	6.09
benzo(a)pyrene							
	MVDMOC03	Sediments	Dry	0.0815	0.0812	0.0814	0.370
benzo(b)fluoranthene							
	MVDMOC03	Sediments	Dry	0.106	0.107	0.106	0.940

Analyte	Sample Number	Sample Matrix	Basis	Initial Result (ppm/%)	Duplicate Result (ppm/%)	Average	Relative Percent Diff.
benzo(e)pyrene							
	MVDMOC03	Sediments	Dry	0.0571	0.0578	0.0574	1.22
benzo(g,h,i)perylene							
	MVDMOC03	Sediments	Dry	0.0592	0.0616	0.0604	3.97
benzo(k)fluoranthene							
	MVDMOC03	Sediments	Dry	0.0382	0.0389	0.0386	1.82
beta BHC							
	MVDMOC03	Sediments	Dry	< 0.0000660	< 0.0000660	0.0000330	0.000
biphenyl							
	MVDMOC03	Sediments	Dry	0.00120	0.00120	0.00120	0.000
chlorpyrifos							
	MVDMOC03	Sediments	Dry	0.000227	0.000216	0.000222	4.97
chrysene							
	MVDMOC03	Sediments	Dry	0.0913	0.0925	0.0919	1.31
cis-nonachlor							
	MVDMOC03	Sediments	Dry	0.0000690	0.0000840	0.0000765	19.6
delta BHC							
	MVDMOC03	Sediments	Dry	< 0.0000760	< 0.0000760	0.0000380	0.000
dibenzothiophene							
	MVDMOC03	Sediments	Dry	0.00390	0.00370	0.00380	5.26
dieldrin							
	MVDMOC03	Sediments	Dry	0.000126	0.000120	0.000123	4.88
endosulfan I							
	MVDMOC03	Sediments	Dry	< 0.000112	< 0.000111	0.0000558	0.900
endosulfan II							
	MVDMOC03	Sediments	Dry	0.000175	0.000173	0.000174	1.15
endosulfan sulfate							
	MVDMOC03	Sediments	Dry	< 0.000103	< 0.000103	0.0000515	0.000
endrin							
	MVDMOC03	Sediments	Dry	< 0.000119	< 0.000119	0.0000595	0.000
fluoranthene							
	MVDMOC03	Sediments	Dry	0.140	0.140	0.140	0.000

Analyte	Sample Number	Sample Matrix	Basis	Initial Result (ppm/%)	Duplicate Result (ppm/%)	Average	Relative Percent Diff.
fluorene							
	MVDMOC03	Sediments	Dry	0.00610	0.00570	0.00590	6.78
gamma BHC							
	MVDMOC03	Sediments	Dry	< 0.0000460	< 0.0000460	0.0000230	0.000
gamma chlordane							
	MVDMOC03	Sediments	Dry	0.000153	0.000173	0.000163	12.3
heptachlor epoxide							
	MVDMOC03	Sediments	Dry	< 0.000183	< 0.000183	0.0000915	0.000
indeno(1,2,3-cd)pyrene							
	MVDMOC03	Sediments	Dry	0.0681	0.0715	0.0698	4.87
mirex							
	MVDMOC03	Sediments	Dry	< 0.0000430	< 0.0000430	0.0000215	0.000
n-decane							
	MVDMOC03	Sediments	Dry	< 0.0110	< 0.0110	0.00549	0.200
n-docosane							
	MVDMOC03	Sediments	Dry	0.0408	0.0444	0.0426	8.51
n-dodecane							
	MVDMOC03	Sediments	Dry	< 0.00800	< 0.00798	0.00400	0.200
n-dotriacontane							
	MVDMOC03	Sediments	Dry	0.112	0.111	0.112	1.02
n-eicosane							
	MVDMOC03	Sediments	Dry	0.0408	0.0444	0.0426	8.51
n-heneicosane							
	MVDMOC03	Sediments	Dry	0.0612	0.0667	0.0639	8.51
n-hentriacontane							
	MVDMOC03	Sediments	Dry	1.57	1.59	1.58	1.10
n-heptacosane							
	MVDMOC03	Sediments	Dry	0.694	0.644	0.669	7.39
n-heptadecane							
	MVDMOC03	Sediments	Dry	0.0408	0.0444	0.0426	8.51
n-hexacosane							
	MVDMOC03	Sediments	Dry	0.0816	0.0778	0.0797	4.84

Analyte	Sample Number	Sample Matrix	Basis	Initial Result (ppm/%)	Duplicate Result (ppm/%)	Average	Relative Percent Diff.
n-hexadecane							
	MVDMOC03	Sediments	Dry	< 0.0130	< 0.0130	0.00649	0.200
n-nonacosane							
	MVDMOC03	Sediments	Dry	1.49	1.58	1.53	5.74
n-nonadecane							
	MVDMOC03	Sediments	Dry	0.0510	0.0556	0.0533	8.51
n-octacosane							
	MVDMOC03	Sediments	Dry	0.133	0.122	0.127	8.19
n-octadecane							
	MVDMOC03	Sediments	Dry	< 0.0130	< 0.0130	0.00649	0.200
n-pentacosane							
	MVDMOC03	Sediments	Dry	0.337	0.311	0.324	7.91
n-pentadecane							
	MVDMOC03	Sediments	Dry	< 0.0170	< 0.0170	0.00849	0.200
n-tetracosane							
	MVDMOC03	Sediments	Dry	0.0714	0.0667	0.0690	6.90
n-tetradecane							
	MVDMOC03	Sediments	Dry	< 0.0140	< 0.0140	0.00699	0.200
n-tetratriacontane							
	MVDMOC03	Sediments	Dry	0.0510	0.0556	0.0533	8.51
n-triacontane							
	MVDMOC03	Sediments	Dry	0.153	0.156	0.154	1.62
n-tricosane							
	MVDMOC03	Sediments	Dry	0.163	0.167	0.165	2.06
n-tridecane							
	MVDMOC03	Sediments	Dry	< 0.0130	< 0.0130	0.00649	0.200
n-tritriacontane							
	MVDMOC03	Sediments	Dry	0.469	0.456	0.462	2.99
n-undecane							
	MVDMOC03	Sediments	Dry	< 0.0120	< 0.0120	0.00599	0.200
naphthalene							
	MVDMOC03	Sediments	Dry	0.00560	0.00520	0.00540	7.41

Analyte	Sample Number	Sample Matrix	Basis	Initial Result (ppm/%)	Duplicate Result (ppm/%)	Average	Relative Percent Diff.
o,p'-DDD							
	MVDMOC03	Sediments	Dry	0.000435	0.000384	0.000410	12.4
o,p'-DDE							
	MVDMOC03	Sediments	Dry	0.0000690	0.0000720	0.0000705	4.26
o,p'-DDT							
	MVDMOC03	Sediments	Dry	< 0.0000960	< 0.0000960	0.0000480	0.000
oxychlordane							
	MVDMOC03	Sediments	Dry	< 0.0000510	< 0.0000510	0.0000255	0.000
p,p'-DDD							
	MVDMOC03	Sediments	Dry	0.000378	0.000416	0.000397	9.57
p,p'-DDE							
	MVDMOC03	Sediments	Dry	0.00147	0.00150	0.00148	2.23
p,p'-DDT							
	MVDMOC03	Sediments	Dry	0.000275	0.000242	0.000258	12.8
pentachloro-anisole							
	MVDMOC03	Sediments	Dry	< 0.0000600	< 0.0000600	0.0000300	0.000
perylene							
	MVDMOC03	Sediments	Dry	0.0282	0.0265	0.0274	6.22
phenanthrene							
	MVDMOC03	Sediments	Dry	0.0726	0.0709	0.0718	2.37
phytane							
	MVDMOC03	Sediments	Dry	0.0204	0.0222	0.0213	8.51
pristane							
	MVDMOC03	Sediments	Dry	< 0.0120	< 0.0120	0.00599	0.200
pyrene							
	MVDMOC03	Sediments	Dry	0.114	0.122	0.118	6.78
toxaphene							
	MVDMOC03	Sediments	Dry	< 0.00446	< 0.00445	0.00223	0.200
trans-nonachlor							
	MVDMOC03	Sediments	Dry	0.000195	0.000168	0.000182	14.9

7. Spike Recoveries

Analyte	Sample Number	Sample Matrix	Basis	Spike Level (ppm/%)	Amount Recovered (ppm/%)	*** Spike Background	Percent Recovery
1,2,3,4-Tetrachlorobenzene							
	MVDMOC05	Sediments	Dry	0.00270	0.00184	45.0	68.3
1,2,4,5-Tetrachlorobenzene							
	MVDMOC05	Sediments	Dry	0.00270	0.00194	65.1	71.8
1,6,7-Trimethyl-naphthalene							
	MVDMOC05	Sediments	Dry	0.00670	0.00620	6.70	92.5
1-methylnaphthalene							
	MVDMOC05	Sediments	Dry	0.00670	0.00640	1.91	95.5
1-methylphenanthrene							
	MVDMOC05	Sediments	Dry	0.00670	0.00560	0.300	83.6
2,6-dimethylnaphthalene							
	MVDMOC05	Sediments	Dry	0.00670	0.00610	1.76	91.0
2-methylnaphthalene							
	MVDMOC05	Sediments	Dry	0.00670	0.00620	1.37	92.5
Aldrin							
	MVDMOC05	Sediments	Dry	0.00270	0.00277	54.6	103
Benzo(a)anthracene							
	MVDMOC05	Sediments	Dry	0.00670	0.00400	0.0400	59.7
Dibenz(a,h)anthracene							
	MVDMOC05	Sediments	Dry	0.00670	0.00500	0.120	74.6
HCB							
	MVDMOC05	Sediments	Dry	0.00270	0.00278	115	103
Heptachlor							
	MVDMOC05	Sediments	Dry	0.00270	0.00235	58.7	87.0
Pentachlorobenzene							
	MVDMOC05	Sediments	Dry	0.00270	0.00219	90.0	81.2
acenaphthalene							
	MVDMOC05	Sediments	Dry	0.00670	0.00530	0.220	79.1
acenaphthene							

Analyte	Sample Number	Sample Matrix	Basis	Spike Level (ppm/%)	Amount Recovered (ppm/%)	*** Spike Background	Percent Recovery
	MVDMOC05	Sediments	Dry	0.00670	0.00470	1.05	70.2
alpha BHC							
	MVDMOC05	Sediments	Dry	0.00270	0.00199	59.3	73.7
alpha chlordane							
	MVDMOC05	Sediments	Dry	0.00270	0.00316	120.	117
anthracene							
	MVDMOC05	Sediments	Dry	0.00670	0.00490	0.180	73.1
benzo(a)pyrene							
	MVDMOC05	Sediments	Dry	0.00670	0.0120	0.0300	179
benzo(b)fluoranthene							
	MVDMOC05	Sediments	Dry	0.00670	0.00600	0.0200	89.6
benzo(e)pyrene							
	MVDMOC05	Sediments	Dry	0.00670	0.0160	0.0400	239
benzo(g,h,i)perylene							
	MVDMOC05	Sediments	Dry	0.00670	0.00500	0.0400	74.6
benzo(k)fluoranthene							
	MVDMOC05	Sediments	Dry	0.00670	0.00700	0.0600	104
beta BHC							
	MVDMOC05	Sediments	Dry	0.00270	0.00233	81.8	86.3
biphenyl							
	MVDMOC05	Sediments	Dry	0.00670	0.00770	3.35	115
chlorpyrifos							
	MVDMOC05	Sediments	Dry	0.00270	0.00233	8.85	86.4
chrysene							
	MVDMOC05	Sediments	Dry	0.00670	0.00600	0.0200	89.6
cis-nonachlor							
	MVDMOC05	Sediments	Dry	0.00270	0.00233	35.5	86.4
delta BHC							
	MVDMOC05	Sediments	Dry	0.00270	0.00237	71.0	87.8
dibenzothiophene							
	MVDMOC05	Sediments	Dry	0.00670	0.00580	0.620	86.6
dieldrin							

Analyte	Sample Number	Sample Matrix	Basis	Spike Level (ppm/%)	Amount Recovered (ppm/%)	*** Spike Background	Percent Recovery
	MVDMOC05	Sediments	Dry	0.00270	0.00251	13.0	92.8
endosulfan II							
	MVDMOC05	Sediments	Dry	0.00270	0.00268	52.4	99.4
endosulfan sulfate							
	MVDMOC05	Sediments	Dry	0.00270	0.00256	52.4	94.9
endrin							
	MVDMOC05	Sediments	Dry	0.00270	0.00306	45.4	113
fluoranthene							
	MVDMOC05	Sediments	Dry	0.00670	0.0420	0.0200	627
fluorene							
	MVDMOC05	Sediments	Dry	0.00670	0.00560	0.570	83.6
gamma BHC							
	MVDMOC05	Sediments	Dry	0.00270	0.00246	117	91.2
gamma chlordane							
	MVDMOC05	Sediments	Dry	0.00270	0.00309	104	115
heptachlor epoxide							
	MVDMOC05	Sediments	Dry	0.00270	0.00269	29.5	99.5
indeno(1,2,3-cd)pyrene							
	MVDMOC05	Sediments	Dry	0.00670	0.00600	0.0400	89.6
mirex							
	MVDMOC05	Sediments	Dry	0.00270	0.00254	126	94.1
n-decane							
	MVDMOC05	Sediments	Dry	0.664	0.373	121	56.3
n-docosane							
	MVDMOC05	Sediments	Dry	0.664	0.641	7.80	96.6
n-dodecane							
	MVDMOC05	Sediments	Dry	0.659	0.575	165	87.2
n-dotriacontane							
	MVDMOC05	Sediments	Dry	0.666	0.597	2.09	89.6
n-eicosane							
	MVDMOC05	Sediments	Dry	0.666	0.578	15.6	86.9
n-heneicosane							

Analyte	Sample Number	Sample Matrix	Basis	Spike Level (ppm/%)	Amount Recovered (ppm/%)	*** Spike Background	Percent Recovery
	MVDMOC05	Sediments	Dry	0.666	0.598	4.47	89.9
n-hentriacontane							
	MVDMOC05	Sediments	Dry	0.659	0.572	0.140	86.8
n-heptacosane							
	MVDMOC05	Sediments	Dry	0.657	0.686	0.360	104
n-heptadecane							
	MVDMOC05	Sediments	Dry	0.660	0.641	4.43	97.0
n-hexacosane							
	MVDMOC05	Sediments	Dry	0.666	0.609	3.91	91.4
n-hexadecane							
	MVDMOC05	Sediments	Dry	0.663	0.652	31.2	98.4
n-nonacosane							
	MVDMOC05	Sediments	Dry	0.662	0.497	0.110	75.0
n-nonadecane							
	MVDMOC05	Sediments	Dry	0.666	0.631	7.83	94.7
n-octacosane							
	MVDMOC05	Sediments	Dry	0.665	0.608	2.32	91.3
n-octadecane							
	MVDMOC05	Sediments	Dry	0.667	0.642	31.3	96.3
n-pentacosane							
	MVDMOC05	Sediments	Dry	0.660	0.613	0.910	92.9
n-pentadecane							
	MVDMOC05	Sediments	Dry	0.660	0.676	77.7	102
n-tetracosane							
	MVDMOC05	Sediments	Dry	0.666	0.630	4.82	94.6
n-tetradecane							
	MVDMOC05	Sediments	Dry	0.664	0.625	95.0	94.0
n-tetratriacontane							
	MVDMOC05	Sediments	Dry	0.659	0.577	3.10	87.5
n-triacontane							
	MVDMOC05	Sediments	Dry	0.661	0.618	2.14	93.4
n-tricosane							

Analyte	Sample Number	Sample Matrix	Basis	Spike Level (ppm/%)	Amount Recovered (ppm/%)	*** Spike Background	Percent Recovery
	MVDMOC05	Sediments	Dry	0.657	0.554	1.58	84.2
n-tridecane							
	MVDMOC05	Sediments	Dry	0.661	0.604	102	91.3
n-tritriacontane							
	MVDMOC05	Sediments	Dry	0.665	0.631	0.620	94.9
n-undecane							
	MVDMOC05	Sediments	Dry	0.666	0.531	111	79.7
naphthalene							
	MVDMOC05	Sediments	Dry	0.00670	0.00590	0.730	88.1
o,p'-DDD							
	MVDMOC05	Sediments	Dry	0.00270	0.00304	4.77	113
o,p'-DDE							
	MVDMOC05	Sediments	Dry	0.00270	0.00247	41.5	91.6
o,p'-DDT							
	MVDMOC05	Sediments	Dry	0.00270	0.00257	22.5	95.3
oxychlordane							
	MVDMOC05	Sediments	Dry	0.00270	0.00254	106	93.9
p,p'-DDD							
	MVDMOC05	Sediments	Dry	0.00270	0.00282	4.59	104
p,p'-DDE							
	MVDMOC05	Sediments	Dry	0.00270	0.00270	1.25	100.
p,p'-DDT							
	MVDMOC05	Sediments	Dry	0.00270	0.00290	4.35	108
pentachloro-anisole							
	MVDMOC05	Sediments	Dry	0.00270	0.00267	27.6	98.9
perylene							
	MVDMOC05	Sediments	Dry	0.00670	0.00620	0.140	92.5
phenanthrene							
	MVDMOC05	Sediments	Dry	0.00670	0.00600	0.0400	89.6
phytane							
	MVDMOC05	Sediments	Dry	0.655	0.599	12.3	91.6
pristane							

Analyte	Sample Number	Sample Matrix	Basis	Spike Level (ppm/%)	Amount Recovered (ppm/%)	*** Spike Background	Percent Recovery
	MVDMOC05	Sediments	Dry	0.662	0.600	31.1	90.6
pyrene							
	MVDMOC05	Sediments	Dry	0.00670	0.0670	0.0200	1000
trans-nonachlor							
	MVDMOC05	Sediments	Dry	0.00270	0.00239	7.99	88.4

*** For a spike to be a valid measure of method accuracy, this ratio must be higher than 1.0.

10. QAQC Summary

1. Procedural Blank Summary

Procedural Blank Summary of Blank Equivalent Concentration (BEC) Data

Within a lab sample matrix, there must be three or more Blank results for a given analyte in order to generate a report.

10.2. Duplicate Summary

Duplicate Summary of Relative Percent Difference (RPD) Data

Within a lab sample matrix and concentration range, there must be three or more Duplicate results for a given analyte in order to generate a report.

10.3. Spike Summary

Spike Summary of Percent Recovery (PR) Data

Within a lab sample matrix, there must be three or more Spike results for a given analyte in order to generate a report.

10.4. SRM Summary

Standard Reference Material Summary of Percent Recovery (PR) Data

Within an SRM ID, there must be three or more Recoveries for a given analyte in order to generate a report.

11. QA/QC Anomalies

1. Blank Frequency Anomalies

The required number of blank analyses were performed.

11.2. Duplicate Frequency Anomalies

The required number of duplicate analyses were performed.

11.3. Spike Frequency Anomalies

The required number of spike sample analyses were performed with the following exceptions.

Analyte	Lab Matrix	Number of Samples	Number of Spikes	Frequency (%)	See QA/QC Note No.
BHC (Total)	Soil/Sediment	5	0	0	1
C1-chrysenes	Soil/Sediment	5	0	0	2
C1-dibenzothiophenes	Soil/Sediment	5	0	0	3
C1-Fluoranthenes & Pyrenes	Soil/Sediment	5	0	0	4
C1-fluorenes	Soil/Sediment	5	0	0	5
C1-naphthalenes	Soil/Sediment	5	0	0	6
C1-Phenanthrenes & Anthracenes	Soil/Sediment	5	0	0	7
C2-chrysenes	Soil/Sediment	5	0	0	8
C2-dibenzothiophenes	Soil/Sediment	5	0	0	9
C2-fluorenes	Soil/Sediment	5	0	0	10
C2-naphthalenes	Soil/Sediment	5	0	0	11
C2-Phenanthrenes & Anthracenes	Soil/Sediment	5	0	0	12
C3-chrysenes	Soil/Sediment	5	0	0	13
C3-	Soil/Sediment	5	0	0	14

The required number of spike sample analyses were performed with the following exceptions.					
Analyte	**Lab Matrix**	**Number of Samples**	**Number of Spikes**	**Frequency (%)**	**See QA/QC Note No.**
dibenzothiophenes					
C3-fluorenes	Soil/Sediment	5	0	0	15
C3-naphthalenes	Soil/Sediment	5	0	0	16
C3-Phenanthrenes & Anthracenes	Soil/Sediment	5	0	0	17
C4-chrysenes	Soil/Sediment	5	0	0	18
C4-naphthalenes	Soil/Sediment	5	0	0	19
C4-Phenanthrenes & Anthracenes	Soil/Sediment	5	0	0	20
DDMU	Soil/Sediment	5	0	0	21
Total Petroleum Hydrocarbons	Soil/Sediment	5	0	0	22

11.4. Reference Material Frequency Anomalies

No Standard Reference Material data exists in this set of results; therefore, the anomaly test was not performed.

11.5. Mass Spec Frequency Anomalies

The required number of mass spec confirmations were performed with the following exceptions.				
Lab Matrix	**Number of Analytes**	**Number of Confirmations**	**Frequency (%)**	**See QA/QC Note No.**
Soil/Sediment	3	0	0	23

11.6. Limit of Detection Anomalies

Limits of Detection were within the contract requirements.

11.7. Blank Anomalies

Procedural Blank analyses were acceptable.

11.8. Duplicate Anomalies

All duplicate results were within normal limits.

11.9. Spike Anomalies

All spike results were within normal limits with the following exceptions.									
Analyte	**Sample Number**	**Lab Matrix**	**Sample Result ppm/%**	**LOD ppm/%**	**Spike Result ppm/%**	**Spike Level ppm/%**	**% Recovery**	**Spike / Background**	**See QA/QC Note No.**
n-decane	MVDMOC05	Soil/Sediment	0.0110	0.0110	0.379	0.664	57.1	60.4	24

11.10. S.R.M. Anomalies

No SRM data exists in this set of results; therefore, the anomaly test was not performed.

11.11. QA/QC Notes

QA/QC Note Number and Comments
1-22 It is not practical to spike with every analyte. The procedure used, is acceptable.
23 Adequate confirmations were performed.
24 Recovery of n-decane from spiked sediment was slightly low. This should have no effect on the interpretation of the data.

12. Analytical Methods

Below are the analytical methods used by TDI to produce the results included in this report.

Method Codes:	005

Lab Matrix	Analyte
Soil/Sediment	% Moisture

Method Code: 005

LABORATORY: TDI Brooks International, Inc.

Sediment Extraction Method (PAH and OCs)

Sediment samples are either immediately processed or stored frozen (- 20°C) until processing. A sediment aliquot is dried in a convection oven at 40°C. After the sediment is dry is it thoroughly homogenized using a ceramic motar and pestle. An additional aliquot of approximately 1 g of wet sediment is removed and dried in an oven at 105°C to a constant weight to determine % moisture. Samples are extracted using a Dionex ASE200 Accelerated Solvent Extractor (ASE). The dried sample is loaded into 22 or 33 mL stainless steel ASE extraction tubes. The extractions are performed using 100% dicholormethane at 100 °C and 2000 psi. The extracted organics dissolved in the solvent are collected in 60 mL glass vials. The extract is concentrated to approximately 10 mL in the collection vials and then transferred to 25 mL Kurdena-Danish (KD) concentrator tubes. The sample extract is concentrated to 3 mL in a water bath at 55-60°C. If extractable organic material weight is required, a 100 mL aliquot is removed and weighed using a microbalance. Interfering non- contaminant organic materials must be removed prior to instrument analyses.

The extract is processed through silica gel/alumina chromatography columns. The sample extract is loaded on top of 300 mm x 19 mm glass liquid chromatography columns packed with 10 g of deactivated alumina and 20 g of deactivated silica gel. The columns are loaded in 100 % dichloromethane. The dichloromethane is replaced by adding 40 mL of pentane. The extract is carefully added to the top of the chromatography columns. The column is flushed at a rate of 1-2 mL per minute using 200 mL of 50:50 pentane/dichloromethane and collected into 250 mL flasks. The eluent collected in the 250 mL flask is evaporated to 2 mL using a waterbath at 55-50°C. The samples is transferred into 2 mL amber vials. The concentrated extract is then analyzed by GC/MS for polynuclear aromatic hydrocarbons (PAHs) or GC/ECD for selected organochlorines (OCs).

Additional column chromatography is required to separate PCBs from toxaphene/pesticides when toxphene analysis is required and to separate planar PCBs. If toxaphene analyses is required, an aliquot of the extract after silica/alumina clean-up is processed through a 3% deactivated silica gel column. The column is packed in dicloromethane which is then flushed with 50 mL of pentane. The sample extract is transferred to the top of the column and flushed with 100 mL of pentane. The fraction contains PCBs and DDTs. The column is then flushed with 120 mL of 50:50 pentane/dichloromethane. This fraction contains toxaphene and chlorinated pesticides. Both fractions are reduced to 1 mL using a water bath at 55-60°C. The extracts are then ready for instrument analysis.

If planar PCB analyses are required, the PCB/DDT fraction prepared by 3% silica gel column is further processed by column chromatography packed with 2 g of 1:19 (5% by weight) mixture of activated carbon/Celite. The column and flushed with 25 mL of 1:4 dichloromethane/cyclohexane mixture. The sample is added to the top of the column and flushed with 50 mL of 1:4 dichloromethane/cyclohexane mixture, followed by 30 mL of 9:1 dichloromethane/toluene. This is followed by the addition of 40 mL of toluene. The toluene fraction contains the planar PCBs and is concentrated to 1 mL in a Zymark TurboVap II concentrator at 42°C and 20 psi. The sample is ready for instrument analysis.

References:

Lauenstein, G.G. and A.Y. Cantillo, ed. (1993). Sampling Analytical Methods of the National Status and Trends Program National Benthic Surveillance and Mussel Watch Projects 1984-1992; Volume IV: Comprehensive Descriptions of Trace Organic Analytical Methods. NOAA Technical memorandum NOS ORCA 71, Silver Spring, MD.

U.S. Environmental Protection Agency. 2001. National Coastal Assessment Quality Assurance Project Plan 2001-2004. United States Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R- 01/002.

Environmental Protection Agency, "Method 3545: Pressurized Fluid Extraction (PFE)," in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods EPA SW-846 [Version 2 (December 1997), Integrated Manual through Update III] Washington DC, U.S. Environmental Protection Agency (1997)

Zuloaga, O.; Etxebarria, N.; Fernandez L. A.;Madariaga, J. M.; Optimization and comparison of MAE, ASE and Soxhlet extraction for the determination of HCH isomers in soil samples. Fresenius J Anal Chem, 2000, 367, 733-737.

Schantz, M.; Nichols, J. J.; Wise, S. A.; Evaluation of Pressurized Fluid Extraction for the Extraction of Environmental Matrix Reference Material, Anal. Chem., 1997, 69, 4210-4219.

Method Codes:	005 002

Lab Matrix	Analyte
Soil/Sediment	1,6,7-Trimethyl-naphthalene
	1-methylnaphthalene
	1-methylphenanthrene
	2,6-dimethylnaphthalene
	2-methylnaphthalene
	Benzo(a)anthracene
	C1-Fluoranthenes & Pyrenes

C1-Phenanthrenes & Anthracenes
C1-chrysenes
C1-dibenzothiophenes
C1-fluorenes
C1-naphthalenes
C2-Phenanthrenes & Anthracenes
C2-chrysenes
C2-dibenzothiophenes
C2-fluorenes
C2-naphthalenes
C3-Phenanthrenes & Anthracenes
C3-chrysenes
C3-dibenzothiophenes
C3-fluorenes
C3-naphthalenes
C4-Phenanthrenes & Anthracenes
C4-chrysenes
C4-naphthalenes
Dibenz(a,h)anthracene
acenaphthalene
acenaphthene
anthracene
benzo(a)pyrene
benzo(b)fluoranthene
benzo(e)pyrene
benzo(g,h,i)perylene
benzo(k)fluoranthene
biphenyl
chrysene
dibenzothiophene
fluoranthene
fluorene
indeno(1,2,3-cd)pyrene
naphthalene

perylene
phenanthrene
pyrene

Method Code: 005

LABORATORY: TDI Brooks International, Inc.

Sediment Extraction Method (PAH and OCs)

Sediment samples are either immediately processed or stored frozen (- 20°C) until processing. A sediment aliquot is dried in a convection oven at 40°C. After the sediment is dry is it thoroughly homogenized using a ceramic motar and pestle. An additional aliquot of approximately 1 g of wet sediment is removed and dried in an oven at 105°C to a constant weight to determine % moisture. Samples are extracted using a Dionex ASE200 Accelerated Solvent Extractor (ASE). The dried sample is loaded into 22 or 33 mL stainless steel ASE extraction tubes. The extractions are performed using 100% dicholormethane at 100 °C and 2000 psi. The extracted organics dissolved in the solvent are collected in 60 mL glass vials. The extract is concentrated to approximately 10 mL in the collection vials and then transferred to 25 mL Kurdena-Danish (KD) concentrator tubes. The sample extract is concentrated to 3 mL in a water bath at 55-60°C. If extractable organic material weight is required, a 100 mL aliquot is removed and weighed using a microbalance. Interfering non- contaminant organic materials must be removed prior to instrument analyses.

The extract is processed through silica gel/alumina chromatography columns. The sample extract is loaded on top of 300 mm x 19 mm glass liquid chromatography columns packed with 10 g of deactivated alumina and 20 g of deactivated silica gel. The columns are loaded in 100 % dichloromethane. The dichloromethane is replaced by adding 40 mL of pentane. The extract is carefully added to the top of the chromatography columns. The column is flushed at a rate of 1-2 mL per minute using 200 mL of 50:50 pentane/dichloromethane and collected into 250 mL flasks. The eluent collected in the 250 mL flask is evaporated to 2 mL using a waterbath at 55-50°C. The samples is transferred into 2 mL amber vials. The concentrated extract is then analyzed by GC/MS for polynuclear aromatic hydrocarbons (PAHs) or GC/ECD for selected organochlorines (OCs).

Additional column chromatography is required to separate PCBs from toxaphene/pesticides when toxphene analysis is required and to separate planar PCBs. If toxaphene analyses is required, an aliquot of the extract after silica/alumina clean-up is processed through a 3% deactivated silica gel column. The column is packed in dicloromethane which is then flushed with 50 mL of pentane. The sample extract is transferred to the top of the column and flushed with 100 mL of pentane. The fraction contains PCBs and DDTs. The column is then flushed with 120 mL of 50:50 pentane/dichloromethane. This fraction contains toxaphene and chlorinated pesticides. Both fractions are reduced to 1 mL using a water bath at 55-60°C. The extracts are then ready for instrument analysis.

If planar PCB analyses are required, the PCB/DDT fraction prepared by 3% silica gel column is further processed by column chromatography packed with 2 g of 1:19 (5% by weight) mixture of activated carbon/Celite. The column and flushed with 25 mL of 1:4 dichloromethane/cyclohexane mixture. The sample is added to the top of the column and flushed with 50 mL of 1:4 dichloromethane/cyclohexane mixture, followed by 30 mL of 9:1 dichloromethane/toluene. This is followed by the addition of 40 mL of toluene. The toluene fraction contains the planar PCBs and is concentrated to 1 mL in a Zymark TurboVap II concentrator at 42°C and 20 psi. The sample is ready for instrument analysis.

References:

Lauenstein, G.G. and A.Y. Cantillo, ed. (1993). Sampling Analytical Methods of the National Status and Trends Program National Benthic Surveillance and Mussel Watch Projects 1984-1992; Volume IV: Comprehensive Descriptions of Trace Organic Analytical Methods. NOAA Technical memorandum NOS ORCA 71, Silver Spring, MD.

U.S. Environmental Protection Agency. 2001. National Coastal Assessment Quality Assurance Project Plan 2001-2004. United States Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R- 01/002.

Environmental Protection Agency, "Method 3545: Pressurized Fluid Extraction (PFE)," in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods EPA SW-846 [Version 2 (December 1997), Integrated Manual through Update III] Washington DC, U.S. Environmental Protection Agency (1997)

Zuloaga, O.; Etxebarria, N.; Fernandez L. A.;Madariaga, J. M.; Optimization and comparison of MAE, ASE and Soxhlet extraction for the determination of HCH isomers in soil samples. Fresenius J Anal Chem, 2000, 367, 733-737.

Schantz, M.; Nichols, J. J.; Wise, S. A.; Evaluation of Pressurized Fluid Extraction for the Extraction of Environmental Matrix Reference Material, Anal. Chem., 1997, 69, 4210-4219.

Method Code: 002

LABORATORY: TDI Brooks International, Inc.

Aromatic Hydrocarbon Determination by Selected
Ion Monitoring (SIM) Gas Chromatography/
Mass Spectrometry (GC/MS)

Polycyclic aromatic hydrocarbons (PAH) and their alkylated homologues are analyzed in sample extracts by a HewlettPackard, model 5890 GS and model 5972 MS operated in SIM using a capillary column. The GC is operated in splitless mode and the capillary column is an Agilent Technologies HP-5MS (60 m x 0.25 mm ID and 0.25 mm film thickness). The carrier gas is helium at a flow rate of 1 mL/minute. The temperature of the injection port is 300°C and transfer line is 290°C. The initial oven temperature is 60°C, the ramp rate is 7°C/minutes to a final oven temperature of 310°C and held for 20 minutes. For analyte identification, the extracted ion current profiles of the primary m/z and the confirmatory ion for each analyte must be at a maximum in the same scan or within one scan of each other and the retention time must fall with 5 seconds of the retention time of the authentic standard or alkyl homologue grouping. The pattern of alkylated PAH homologue groupings is established by analysis of reference oil standards. The relative peak heights of the primary mass ion compared to the confirmation or secondary mass ion must fall within 30 % of the relative intensities of these masses in a reference mass spectrum.

REFERENCES:

Lauenstein, G.G. and A.Y. Cantillo, ed. (1993). Sampling Analytical Methods of the National Status and Trends Program National Benthic Surveillance and Mussel Watch Projects 1984-1992; Volume IV: Comprehensive Descriptions of Trace Organic Analytical Methods. NOAA Technical memorandum NOS ORCA 71, Silver Spring, MD.

U.S. Environmental Protection Agency. 2001. National Coastal Assessment Quality Assurance Project Plan 2001-2004. United States Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R-01/002.

Method Codes:	005 003

Lab Matrix	Analyte
Soil/Sediment	1,2,3,4-Tetrachlorobenzene
	1,2,4,5-Tetrachlorobenzene
	Aldrin
	BHC (Total)
	DDMU
	HCB
	Heptachlor
	Pentachlorobenzene
	alpha BHC
	alpha chlordane
	beta BHC
	chlorpyrifos
	cis-nonachlor
	delta BHC
	dieldrin
	endosulfan I
	endosulfan II
	endosulfan sulfate
	endrin
	gamma BHC
	gamma chlordane
	heptachlor epoxide
	mirex
	o,p'-DDD
	o,p'-DDE

o,p'-DDT
oxychlordane
p,p'-DDD
p,p'-DDE
p,p'-DDT
pentachloro-anisole
toxaphene
trans-nonachlor

Method Code: 005

LABORATORY: TDI Brooks International, Inc.

Sediment Extraction Method (PAH and OCs)

Sediment samples are either immediately processed or stored frozen (- 20°C) until processing. A sediment aliquot is dried in a convection oven at 40°C. After the sediment is dry is it thoroughly homogenized using a ceramic motar and pestle. An additional aliquot of approximately 1 g of wet sediment is removed and dried in an oven at 105°C to a constant weight to determine % moisture. Samples are extracted using a Dionex ASE200 Accelerated Solvent Extractor (ASE). The dried sample is loaded into 22 or 33 mL stainless steel ASE extraction tubes. The extractions are performed using 100% dicholormethane at 100 °C and 2000 psi. The extracted organics dissolved in the solvent are collected in 60 mL glass vials. The extract is concentrated to approximately 10 mL in the collection vials and then transferred to 25 mL Kurdena-Danish (KD) concentrator tubes. The sample extract is concentrated to 3 mL in a water bath at 55-60°C. If extractable organic material weight is required, a 100 mL aliquot is removed and weighed using a microbalance. Interfering non- contaminant organic materials must be removed prior to instrument analyses.

The extract is processed through silica gel/alumina chromatography columns. The sample extract is loaded on top of 300 mm x 19 mm glass liquid chromatography columns packed with 10 g of deactivated alumina and 20 g of deactivated silica gel. The columns are loaded in 100 % dichloromethane. The dichloromethane is replaced by adding 40 mL of pentane. The extract is carefully added to the top of the chromatography columns. The column is flushed at a rate of 1-2 mL per minute using 200 mL of 50:50 pentane/dichloromethane and collected into 250 mL flasks. The eluent collected in the 250 mL flask is evaporated to 2 mL using a waterbath at 55-50°C. The samples is transferred into 2 mL amber vials. The concentrated extract is then analyzed by GC/MS for polynuclear aromatic hydrocarbons (PAHs) or GC/ECD for selected organochlorines (OCs).

Additional column chromatography is required to separate PCBs from toxaphene/pesticides when toxphene analysis is required and to separate planar PCBs. If toxaphene analyses is required, an aliquot of the extract after silica/alumina clean-up is processed through a 3% deactivated silica gel column. The column is packed in diclorometh ane which is then flushed with 50 mL of pentane. The sample extract is transferred to the top of the column and flushed with 100 mL of pentane. The fraction contains PCBs and DDTs. The column is then flushed with 120 mL of 50:50 pentane/dichloromethane. This fraction contains toxaphene and chlorinated pesticides. Both fractions are reduced to 1 mL using a water bath at 55-60°C. The extracts are then ready for instrument analysis.

If planar PCB analyses are required, the PCB/DDT fraction prepared by 3% silica gel column is further processed by column chromatography packed with 2 g of 1:19 (5% by weight) mixture of activated carbon/Celite. The column and flushed with 25 mL of 1:4 dichloromethane/cyclohexane mixture. The sample is added to the top of the column and flushed with 50 mL of 1:4 dichloromethane/cyclohexane mixture, followed by 30 mL of 9:1 dichloromethane/toluene. This is followed by the addition of 40 mL of toluene. The toluene fraction contains the planar PCBs and is concentrated to 1 mL in a Zymark TurboVap II concentrator at 42°C and 20 psi. The sample is ready for instrument analysis.

References:

Lauenstein, G.G. and A.Y. Cantillo, ed. (1993). Sampling Analytical Methods of the National Status and Trends Program National Benthic Surveillance and Mussel Watch Projects 1984-1992; Volume IV: Comprehensive Descriptions of Trace Organic Analytical Methods. NOAA Technical memorandum NOS ORCA 71, Silver Spring, MD.

U.S. Environmental Protection Agency. 2001. National Coastal Assessment Quality Assurance Project Plan 2001-2004. United States Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R- 01/002.

Environmental Protection Agency, "Method 3545: Pressurized Fluid Extraction (PFE)," in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods EPA SW-846 [Version 2 (December 1997), Integrated Manual through Update III] Washington DC, U.S. Environmental Protection Agency (1997)

Zuloaga, O.; Etxebarria, N.; Fernandez L. A.;Madariaga, J. M.; Optimization and comparison of MAE, ASE and Soxhlet extraction for the determination of HCH isomers in soil samples. Fresenius J Anal Chem, 2000, 367, 733-737.

Schantz, M.; Nichols, J. J.; Wise, S. A.; Evaluation of Pressurized Fluid Extraction for the Extraction of Environmental Matrix Reference Material, Anal. Chem., 1997, 69, 4210-4219.

Method Code: 003

LABORATORY: TDI Brooks International, Inc.

Chlorinated Hydrocarbon Determination by Gas Chromatography/Electron Capture Detection (GC/ECD)

Chlorinated hydrocarbons are determined in samples by GC/ECD. Samples are extracted as previously described and analyzed on a HewletPackard (HP), model 5890 GC equipped with an ECD. Between 1 to 5 mL of sample is injected using an HP, model 7673A autosampler. The instrument is set up with dual columns. The primary capillary column is a J&W DB-5 (30 m x 24 mm ID and 0.25 mm film thickness). The second column, a confirmation column, is a J&W DB-17HT (30 m x 0.25 mm ID and 0.15 mm film thickness). The inlet system is splitless and the carrier gas is helium at a flow rate of 1 mL/min. For the analysis of standard halogenated hydrocarbons, the temperature of the injection port is 275°C and the detector is 325°C. The initial oven temperature is 100°C with a hold time of 1 minute. The ramp rate is 5°C/minute to 140°C with a hold time of 1 minute, followed by a ramp rate of 1.5°C /minute to 250C with a hold time of 1 minute and finally a ramp rate of 10°C/minutes to 300°C with a final hold time of 5 minutes. For planar PCBs the instrument is operated in the splitless mode with helium as the carrier gas with a flow rate of 1 mL/minute. The temperature of the injection port is 275°C and the detector is 325°C. The initial oven temperature is 100°C, which

is held for 1 minute. The ramp rate is 10°C/minute to 150°C, followed by a ramp rate of 6.0°C/minute to 270°C with a hold time of 3 minutes. The retention time of sample analytes must fall within 15 seconds of the retention time of analytes in a calibration standard or a retention index solutions. The levels of aroclors and toxophene are determined using retention index solutions of both complex mixtures. Arochlors are determined in a similar method to that described in EPA SW-846 Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Method 8082 (1997).

REFERENCES:

Lauenstein, G.G. and A.Y. Cantillo, ed. (1993). Sampling Analytical Methods of the National Status and Trends Program National Benthic Surveillance and Mussel Watch Projects 1984-1992; Volume IV: Comprehensive Descriptions of Trace Organic Analytical Methods. NOAA Technical memorandum NOS ORCA 71, Silver Spring, MD.

U.S. Environmental Protection Agency. 2001. National Coastal Assessment Quality Assurance Project Plan 2001-2004. United States Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R-01/002.

Environmental Protection Agency, "Method 8082: Polychlorinated Biphenls (PCBs) by Gas Chromatography," in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods EPA SW-846 [Version 2 (December 1997), Integrated Manual through Update III] Washington DC, U.S. Environmental Protection Agency (1997)

Method Codes:	005 006

Lab Matrix	Analyte
Soil/Sediment	Tot. Organic Carbon

Method Code: 005

LABORATORY: TDI Brooks International, Inc.

Sediment Extraction Method (PAH and OCs)

Sediment samples are either immediately processed or stored frozen (- 20°C) until processing. A sediment aliquot is dried in a convection oven at 40°C. After the sediment is dry is it thoroughly homogenized using a ceramic motar and pestle. An additional aliquot of approximately 1 g of wet sediment is removed and dried in an oven at 105°C to a constant weight to determine % moisture. Samples are extracted using a Dionex ASE200 Accelerated Solvent Extractor (ASE). The dried sample is loaded into 22 or 33 mL stainless steel ASE extraction tubes. The extractions are performed using 100% dicholormethane at 100 °C and 2000 psi. The extracted organics dissolved in the solvent are collected in 60 mL glass vials. The extract is concentrated to approximately 10 mL in the collection vials and then transferred to 25 mL Kurdena-Danish (KD) concentrator tubes. The sample extract is concentrated to 3 mL in a water bath at 55-60°C. If extractable organic material weight is required, a 100 mL aliquot is removed and weighed using a microbalance. Interfering non- contaminant organic materials must be removed prior to instrument

analyses.

The extract is processed through silica gel/alumina chromatography columns. The sample extract is loaded on top of 300 mm x 19 mm glass liquid chromatography columns packed with 10 g of deactivated alumina and 20 g of deactivated silica gel. The columns are loaded in 100 % dichloromethane. The dichloromethane is replaced by adding 40 mL of pentane. The extract is carefully added to the top of the chromatography columns. The column is flushed at a rate of 1-2 mL per minute using 200 mL of 50:50 pentane/dichloromethane and collected into 250 mL flasks. The eluent collected in the 250 mL flask is evaporated to 2 mL using a waterbath at 55-50°C. The samples is transferred into 2 mL amber vials. The concentrated extract is then analyzed by GC/MS for polynuclear aromatic hydrocarbons (PAHs) or GC/ECD for selected organochlorines (OCs).

Additional column chromatography is required to separate PCBs from toxaphene/pesticides when toxphene analysis is required and to separate planar PCBs. If toxaphene analyses is required, an aliquot of the extract after silica/alumina clean-up is processed through a 3% deactivated silica gel column. The column is packed in diclorometh ane which is then flushed with 50 mL of pentane. The sample extract is transferred to the top of the column and flushed with 100 mL of pentane. The fraction contains PCBs and DDTs. The column is then flushed with 120 mL of 50:50 pentane/dichloromethane. This fraction contains toxaphene and chlorinated pesticides. Both fractions are reduced to 1 mL using a water bath at 55-60°C. The extracts are then ready for instrument analysis.

If planar PCB analyses are required, the PCB/DDT fraction prepared by 3% silica gel column is further processed by column chromatography packed with 2 g of 1:19 (5% by weight) mixture of activated carbon/Celite. The column and flushed with 25 mL of 1:4 dichloromethane/cyclohexane mixture. The sample is added to the top of the column and flushed with 50 mL of 1:4 dichloromethane/cyclohexane mixture, followed by 30 mL of 9:1 dichloromethane/toluene. This is followed by the addition of 40 mL of toluene. The toluene fraction contains the planar PCBs and is concentrated to 1 mL in a Zymark TurboVap II concentrator at 42°C and 20 psi. The sample is ready for instrument analysis.

References:

Lauenstein, G.G. and A.Y. Cantillo, ed. (1993). Sampling Analytical Methods of the National Status and Trends Program National Benthic Surveillance and Mussel Watch Projects 1984-1992; Volume IV: Comprehensive Descriptions of Trace Organic Analytical Methods. NOAA Technical memorandum NOS ORCA 71, Silver Spring, MD.

U.S. Environmental Protection Agency. 2001. National Coastal Assessment Quality Assurance Project Plan 2001-2004. United States Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R- 01/002.

Environmental Protection Agency, "Method 3545: Pressurized Fluid Extraction (PFE)," in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods EPA SW-846 [Version 2 (December 1997), Integrated Manual through Update III] Washington DC, U.S. Environmental Protection Agency (1997)

Zuloaga, O.; Etxebarria, N.; Fernandez L. A.;Madariaga, J. M.; Optimization and comparison of MAE, ASE and Soxhlet extraction for the determination of HCH isomers in soil samples. Fresenius J Anal Chem, 2000, 367, 733-737.

Schantz, M.; Nichols, J. J.; Wise, S. A.; Evaluation of Pressurized Fluid Extraction for the Extraction of Environmental Matrix Reference Material, Anal. Chem., 1997, 69, 4210-4219.

Method Code: 006
LABORATORY: TDI Brooks International, Inc. Total Organic and Inorganic Carbon is Soils and Sediments Sediments samples are either immediately processed or stored frozen (- 20°C) until processing. A sediment aliquot is dried in a convection oven at 105°C. For total carbon analysis an aliquot of approximately 350 mg is placed in a clean, carbon-free combustion boat. The sample boats are loaded into a LECO autosampler rack assembly. The dried sample is combusted at 1350°C under an oxygen atmosphere in a LECO CR-412 Carbon Analyzer. Carbon present in the samples is oxidized to form CO2 gas. The gaseous sample flows through a nondispersive infrared (NIDR) detection cell. The mass of carbon dioxide is measured and converted to a percentage value with respect to sample weight. Percent total organic carbon is determined by pre- treating dry samples with 1:1 phosphoric acid to remove all inorganic carbon. Approximately 350 mg of treated sample is loaded into a clean, carbon-free combustion boat. The sample boats are loaded into a LECO autosampler rack assembly. The dried sample is combusted at 1350°C under an oxygen atmosphere in a LECO CR-412 Carbon Analyzer. Carbon present in the samples is oxidized to form CO2 gas. The gaseous sample flows through a nondispersive infrared (NIDR) detection cell. The mass of carbon dioxide is measured and converted to a percentage value with respect to sample weight. References: Kahn, Lloyd. 1988. Determination of total organic carbon is sediment. USEPA.

Method Codes:	005 008

Lab Matrix	Analyte
Soil/Sediment	Total Petroleum Hydrocarbons

Method Code: 005
LABORATORY: TDI Brooks International, Inc. Sediment Extraction Method (PAH and OCs) Sediment samples are either immediately processed or stored frozen (- 20°C) until processing. A sediment aliquot is dried in a convection oven at 40°C. After the sediment is dry is it thoroughly homogenized using a ceramic motar and pestle. An additional aliquot of approximately 1 g of wet sediment is removed and dried in an oven at 105°C to a constant weight to determine % moisture. Samples are extracted using a Dionex ASE200 Accelerated Solvent Extractor (ASE). The dried sample is loaded into 22 or 33 mL stainless steel ASE extraction tubes. The extractions are performed using 100% dicholormethane at 100 °C and 2000 psi. The extracted organics dissolved in the solvent are collected in 60 mL glass vials. The extract is concentrated to approximately 10 mL in the collection vials and then transferred to 25 mL Kurdena-Danish (KD) concentrator tubes. The sample

extract is concentrated to 3 mL in a water bath at 55-60°C. If extractable organic material weight is required, a 100 mL aliquot is removed and weighed using a microbalance. Interfering non- contaminant organic materials must be removed prior to instrument analyses.

The extract is processed through silica gel/alumina chromatography columns. The sample extract is loaded on top of 300 mm x 19 mm glass liquid chromatography columns packed with 10 g of deactivated alumina and 20 g of deactivated silica gel. The columns are loaded in 100 % dichloromethane. The dichloromethane is replaced by adding 40 mL of pentane. The extract is carefully added to the top of the chromatography columns. The column is flushed at a rate of 1-2 mL per minute using 200 mL of 50:50 pentane/dichloromethane and collected into 250 mL flasks. The eluent collected in the 250 mL flask is evaporated to 2 mL using a waterbath at 55-50°C. The samples is transferred into 2 mL amber vials. The concentrated extract is then analyzed by GC/MS for polynuclear aromatic hydrocarbons (PAHs) or GC/ECD for selected organochlorines (OCs).

Additional column chromatography is required to separate PCBs from toxaphene/pesticides when toxphene analysis is required and to separate planar PCBs. If toxaphene analyses is required, an aliquot of the extract after silica/alumina clean-up is processed through a 3% deactivated silica gel column. The column is packed in diclorometh ane which is then flushed with 50 mL of pentane. The sample extract is transferred to the top of the column and flushed with 100 mL of pentane. The fraction contains PCBs and DDTs. The column is then flushed with 120 mL of 50:50 pentane/dichloromethane. This fraction contains toxaphene and chlorinated pesticides. Both fractions are reduced to 1 mL using a water bath at 55-60°C. The extracts are then ready for instrument analysis.

If planar PCB analyses are required, the PCB/DDT fraction prepared by 3% silica gel column is further processed by column chromatography packed with 2 g of 1:19 (5% by weight) mixture of activated carbon/Celite. The column and flushed with 25 mL of 1:4 dichloromethane/cyclohexane mixture. The sample is added to the top of the column and flushed with 50 mL of 1:4 dichloromethane/cyclohexane mixture, followed by 30 mL of 9:1 dichloromethane/toluene. This is followed by the addition of 40 mL of toluene. The toluene fraction contains the planar PCBs and is concentrated to 1 mL in a Zymark TurboVap II concentrator at 42°C and 20 psi. The sample is ready for instrument analysis.

References:

Lauenstein, G.G. and A.Y. Cantillo, ed. (1993). Sampling Analytical Methods of the National Status and Trends Program National Benthic Surveillance and Mussel Watch Projects 1984-1992; Volume IV: Comprehensive Descriptions of Trace Organic Analytical Methods. NOAA Technical memorandum NOS ORCA 71, Silver Spring, MD.

U.S. Environmental Protection Agency. 2001. National Coastal Assessment Quality Assurance Project Plan 2001-2004. United States Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R- 01/002.

Environmental Protection Agency, "Method 3545: Pressurized Fluid Extraction (PFE)," in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods EPA SW-846 [Version 2 (December 1997), Integrated Manual through Update III] Washington DC, U.S. Environmental Protection Agency (1997)

Zuloaga, O.; Etxebarria, N.; Fernandez L. A.;Madariaga, J. M.; Optimization and comparison of MAE, ASE and Soxhlet extraction for the determination of HCH isomers in soil samples. Fresenius J Anal Chem, 2000, 367, 733-737.

Schantz, M.; Nichols, J. J.; Wise, S. A.; Evaluation of Pressurized Fluid Extraction for the Extraction of Environmental Matrix Reference Material, Anal. Chem., 1997, 69, 4210-4219.

Method Code: 008

LABORATORY: TDI Brooks International, Inc.

Determination of Total Petroleum Hydrocarbons
in Soil/Sediment

Sediment samples are extracted as described in method 005. Total petroleum hydrocarbons (TPH) are determined by quantifying the TPH with gas chromatography/flame ionization detection (GC/FID)

TPH are analyzed using a HewelettPackard, model 5890 Gas Chromatograph (GC) with a Flame Ionization Detector (FID) operated in a splitless mode. A HP-1MS capillary column (30m x 0.25 mm ID and 0.25 mm film thickness) is used to resolve peaks. The carrier gas is helium at a flow rate of 1.5 mL/min. The temperature of the injection port is 300°C and transfer line is 300C. The initial oven temperature is 60°C, the ramp rate is 12°C/min to a final oven temperature of 180°C. For analytes of interest, a response factor relative to the internal standard is determined at each calibration level. All 5 response factors are averaged for a mean relative response factor. Data are surrogate corrected. TPH is determined by straight line integration between the retention times for n-C10 and n-C34.

Environmental Protection Agency, "Method 8100/8015. Polynuclear Aromatic Hydrocarbons/Nonhalogenated Organics using GC/FID"," in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods EPA SW-846 [Version 2 (December 1997), Integrated Manual through Update III] Washington DC, U.S. Environmental Protection Agency (1997)

Method Codes:	005 009

Lab Matrix	Analyte
Soil/Sediment	n-decane
	n-docosane
	n-dodecane
	n-dotriacontane
	n-eicosane
	n-heneicosane
	n-hentriacontane
	n-heptacosane
	n-heptadecane
	n-hexacosane
	n-hexadecane

n-nonacosane
n-nonadecane
n-octacosane
n-octadecane
n-pentacosane
n-pentadecane
n-tetracosane
n-tetradecane
n-tetratriacontane
n-triacontane
n-tricosane
n-tridecane
n-tritriacontane
n-undecane
phytane
pristane

Method Code: 005

LABORATORY: TDI Brooks International, Inc.

Sediment Extraction Method (PAH and OCs)

Sediment samples are either immediately processed or stored frozen (- 20°C) until processing. A sediment aliquot is dried in a convection oven at 40°C. After the sediment is dry is it thoroughly homogenized using a ceramic motar and pestle. An additional aliquot of approximately 1 g of wet sediment is removed and dried in an oven at 105°C to a constant weight to determine % moisture. Samples are extracted using a Dionex ASE200 Accelerated Solvent Extractor (ASE). The dried sample is loaded into 22 or 33 mL stainless steel ASE extraction tubes. The extractions are performed using 100% dicholormethane at 100 °C and 2000 psi. The extracted organics dissolved in the solvent are collected in 60 mL glass vials. The extract is concentrated to approximately 10 mL in the collection vials and then transferred to 25 mL Kurdena-Danish (KD) concentrator tubes. The sample extract is concentrated to 3 mL in a water bath at 55-60°C. If extractable organic material weight is required, a 100 mL aliquot is removed and weighed using a microbalance. Interfering non- contaminant organic materials must be removed prior to instrument analyses.

The extract is processed through silica gel/alumina chromatography columns. The sample extract is loaded on top of 300 mm x 19 mm glass liquid chromatography columns packed with 10 g of deactivated alumina and 20 g of deactivated silica gel. The columns are loaded in 100 % dichloromethane. The dichloromethane is replaced by adding 40 mL of pentane. The extract is carefully added to the top of the chromatography columns. The column is flushed at a rate of 1-2 mL per minute using 200 mL of 50:50 pentane/dichloromethane and collected into 250 mL flasks. The eluent collected in the 250 mL flask is evaporated to 2 mL using a

waterbath at 55-50°C. The samples is transferred into 2 mL amber vials. The concentrated extract is then analyzed by GC/MS for polynuclear aromatic hydrocarbons (PAHs) or GC/ECD for selected organochlorines (OCs).

Additional column chromatography is required to separate PCBs from toxaphene/pesticides when toxphene analysis is required and to separate planar PCBs. If toxaphene analyses is required, an aliquot of the extract after silica/alumina clean-up is processed through a 3% deactivated silica gel column. The column is packed in dicloromethane which is then flushed with 50 mL of pentane. The sample extract is transferred to the top of the column and flushed with 100 mL of pentane. The fraction contains PCBs and DDTs. The column is then flushed with 120 mL of 50:50 pentane/dichloromethane. This fraction contains toxaphene and chlorinated pesticides. Both fractions are reduced to 1 mL using a water bath at 55-60°C. The extracts are then ready for instrument analysis.

If planar PCB analyses are required, the PCB/DDT fraction prepared by 3% silica gel column is further processed by column chromatography packed with 2 g of 1:19 (5% by weight) mixture of activated carbon/Celite. The column and flushed with 25 mL of 1:4 dichloromethane/cyclohexane mixture. The sample is added to the top of the column and flushed with 50 mL of 1:4 dichloromethane/cyclohexane mixture, followed by 30 mL of 9:1 dichloromethane/toluene. This is followed by the addition of 40 mL of toluene. The toluene fraction contains the planar PCBs and is concentrated to 1 mL in a Zymark TurboVap II concentrator at 42°C and 20 psi. The sample is ready for instrument analysis.

References:

Lauenstein, G.G. and A.Y. Cantillo, ed. (1993). Sampling Analytical Methods of the National Status and Trends Program National Benthic Surveillance and Mussel Watch Projects 1984-1992; Volume IV: Comprehensive Descriptions of Trace Organic Analytical Methods. NOAA Technical memorandum NOS ORCA 71, Silver Spring, MD.

U.S. Environmental Protection Agency. 2001. National Coastal Assessment Quality Assurance Project Plan 2001-2004. United States Environmental Protection Agency, Office of Research and Development, National Health and Environmental Effects Research Laboratory, Gulf Ecology Division, Gulf Breeze, FL. EPA/620/R- 01/002.

Environmental Protection Agency, "Method 3545: Pressurized Fluid Extraction (PFE)," in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods EPA SW-846 [Version 2 (December 1997), Integrated Manual through Update III] Washington DC, U.S. Environmental Protection Agency (1997)

Zuloaga, O.; Etxebarria, N.; Fernandez L. A.;Madariaga, J. M.; Optimization and comparison of MAE, ASE and Soxhlet extraction for the determination of HCH isomers in soil samples. Fresenius J Anal Chem, 2000, 367, 733-737.

Schantz, M.; Nichols, J. J.; Wise, S. A.; Evaluation of Pressurized Fluid Extraction for the Extraction of Environmental Matrix Reference Material, Anal. Chem., 1997, 69, 4210-4219.

Method Code: 009

LABORATORY: TDI Brooks International, Inc.

Determination of Aliphatic Hydrocarbons in Soil/Sediment

Sediment samples are extracted as described in method 005. Aliphatic hydrocarbons are determined by quantifying target analytes

with a gas chromatography/flame ionization detection (GC/FID)

Aliphatic hydrocarbons are analyzed using a HewelettPackard, model 5890 Gas Chromatograph (GC) with a Flame Ionization Detector (FID) operated in a splitless mode. A HP-1MS capillary column (30m x 0.25 mm ID and 0.25 mm film thickness) is used to resolve peaks. The carrier gas is helium at a flow rate of 1.5 mL/min. The temperature of the injection port is 300°C and transfer line is 300C. The initial oven temperature is 60°C, the ramp rate is 12°C/min to a final oven temperature of 180°C. Normal alkanes with 10 to 34 carbons and the isoprenoids pristine and phytane are determined using this procedure. For analytes of interest, a response factor relative to the internal standard is determined at each calibration level. All 5 response factors are averaged for a mean relative response factor. Data are surrogate corrected.

Environmental Protection Agency, "Method 8100/8015. Polynuclear Aromatic Hydrocarbons/Nonhalogenated Organics using GC/FID"," in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods EPA SW-846 [Version 2 (December 1997), Integrated Manual through Update III] Washington DC, U.S. Environmental Protection Agency (1997).

Method Codes:	007

Lab Matrix	**Analyte**
Soil/Sediment	Grain Size-Clay
	Grain Size-Sand
	Grain Size-Silt

Method Code: 007

LABORATORY: TDI Brooks International, Inc.

Determination of Particle Size Distribution in Sediments

Sediment samples are stored refrigerated at 4°C until processing. Samples are thoroughly mixed and an aliquot of approximately 25 to 50 g is weighed and placed into 750 mL wide-mouth jars. Approximately 250 mL of deflocculent solution (2.5 g/L sodium hexametaphosphate in DI water) is added to the jar. The jar is sealed and shaken until the sample is disaggregated. Once shaken the sample and deflocculent solution is poured through a 63 mm sieve into 1000 mL graduated cylinder. The coarse sediment left on top of the 63 mm sieve is concentrated into a 150 mL beaker. Deflocculent is added to 975 mL in the graduate cylinder. The coarse sediment in the beaker is dried in an oven at 70°C to 90°C. The weight is noted and then transferred to the top sieve (-1 phi) in a sieve stack that is arranged in descending order (-1 phi and +4 phi). The sieve stack is covered and shaken for 15 minutes on a sieve shaker. Empty the material from the top sieve onto a large piece of clean paper and weigh. The material from the next sieve is emptied onto the large piece of clean paper and weighed. Any material that passes through both sieves is added to the graduated cylinder. The phi fraction represents the gravel size and the + 4 phi represents the sand size. The silt/clay fraction is determined by filling the corresponding graduated cylinder to 1000 mL with deflocculent solution. After allowing the cylinder to stand for 24 hours at 24°C, the cylinder is thoroughly mixed. After 20 seconds a 25 mL aliquot is withdrawn from a

depth of 20 cm (representing the silt fraction). The aliquot is emptied into a tared 50 mL beaker. A second 25 mL aliquot is withdrawn from the graduated cylinder froma depth of 10 cm at an interval of 2 hours and 3 minutes (representing the clay fraction) and placed into a tared 50 mL beaker. The 50 mL beakers are dried in an oven at 70°C to 90°C until dry. The dried samples are then weighed.

References:

APHA. 1989. Standard Methods for the Examination of Water and Wastewater. Clesceri, Greenberg, and Trussel, eds. American Public Health Association, 17th edition.

Folk, R.L. 1974. Petrology of Sedimentary Rocks. Hemphill Publishing Co., Austin, TX 184 pp.

Plumb, R.H. 1981. Procedure for Handling and Chemical Analysis of Sediment and Water Samples. Technical Report EPA/CE 81-1, prepared by Great Lakes Laboratory, State University College at Buffalo NY for the U.S. EPA/Corps of Engineers Technical Committee on Criteria for Dredged and Fill Material. Published by the U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Tetra Tech. 1986. Quality Assurance and Quality Control (QA/QC for 301 (h) Monitoring Programs. Guidance on Field and Laboratory Methods. USEPA, TC-3953-04, Final Report, 267 pp.

Analytical Results Report TOC

1. ECDMSAnalytical Results Report 7/15/2004

Catalog Number	Purchase Order Number	Lab ID	Catalog Submitter	ECDMS User ID
5030119	94420-04-Y391	LET	Major, Drew - Concord, NH	r5nefo

Catalog Title	Dam Study - Merrimack Village
Lab Name:	Laboratory and Environmental Testing
DEQ Project ID:	200350004
DEQ Project Title	NH, VT, MA - Contaminant Sampling to Facilitate Dam Removals/Habitat Restoration in New England

Notes, Symbols and Abbreviations Used
Based on the report options selected the report should be **printed in landscape mode**
Notes, Symbols and Abbreviations Used The following may appear before a reported result (e.g. < 1234). < - Less than symbol indicates that the actual result is less than the reported detection limit. > - Greater than symbol indicates that the actual result is greater than the reported result.
All results are reported as 3 significant digits.
All results are reported as parts per million (ppm), or percent, unless otherwise noted.

1. Integrity Report

Lab Receipt Date	06/08/2004	**Lab Approval Date**	06/08/2004

Catalog Problems
No problems reported
Problem Resolution

2. Bulk Data

Sample Number	Sample Matrix	Percent Moisture
MVDMOC01	Sediments	35.7
MVDMOC02	Sediments	31.1
MVDMOC03	Sediments	37.2
MVDMOC04	Sediments	21.1
MVDMOC05	Sediments	54.0

4. Contaminant Concentrations

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
Aluminum						
	MVDMOC01	Sediments	4180	10.0	2690	6.00
	MVDMOC02	Sediments	3480	10.0	2450	7.00
	MVDMOC03	Sediments	5180	10.0	3260	6.00
	MVDMOC04	Sediments	3100	10.0	2440	8.00
	MVDMOC05	Sediments	9450	10.0	4350	5.00
Arsenic						
	MVDMOC01	Sediments	2.90	0.500	1.90	0.300
	MVDMOC02	Sediments	2.30	0.500	1.60	0.400
	MVDMOC03	Sediments	4.20	0.500	2.70	0.300
	MVDMOC04	Sediments	2.40	0.500	1.90	0.400
	MVDMOC05	Sediments	6.40	0.500	2.90	0.200
Boron						
	MVDMOC01	Sediments	< 10.0	10.0	< 6.00	6.00
	MVDMOC02	Sediments	< 10.0	10.0	< 7.00	7.00
	MVDMOC03	Sediments	< 10.0	10.0	< 6.00	6.00
	MVDMOC04	Sediments	< 10.0	10.0	< 8.00	8.00
	MVDMOC05	Sediments	< 10.0	10.0	< 5.00	5.00
Barium						
	MVDMOC01	Sediments	23.0	0.500	15.0	0.300
	MVDMOC02	Sediments	20.0	0.500	14.0	0.400
	MVDMOC03	Sediments	31.0	0.500	20.0	0.300
	MVDMOC04	Sediments	16.0	0.500	13.0	0.400
	MVDMOC05	Sediments	56.5	0.500	26.0	0.200
Beryllium						
	MVDMOC01	Sediments	0.400	0.200	0.200	0.100
	MVDMOC02	Sediments	0.300	0.200	0.200	0.100

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC03	Sediments	0.500	0.200	0.300	0.100
	MVDMOC04	Sediments	0.300	0.200	0.200	0.200
	MVDMOC05	Sediments	0.850	0.200	0.390	0.0900
Cadmium						
	MVDMOC01	Sediments	< 0.200	0.200	< 0.100	0.100
	MVDMOC02	Sediments	< 0.200	0.200	< 0.100	0.100
	MVDMOC03	Sediments	< 0.200	0.200	< 0.100	0.100
	MVDMOC04	Sediments	< 0.200	0.200	< 0.200	0.200
	MVDMOC05	Sediments	0.300	0.200	0.100	0.0900
Chromium						
	MVDMOC01	Sediments	6.00	1.00	3.80	0.600
	MVDMOC02	Sediments	5.10	1.00	3.60	0.700
	MVDMOC03	Sediments	8.30	1.00	5.20	0.600
	MVDMOC04	Sediments	4.30	1.00	3.40	0.800
	MVDMOC05	Sediments	14.0	1.00	6.50	0.500
Copper						
	MVDMOC01	Sediments	3.10	1.00	2.00	0.600
	MVDMOC02	Sediments	2.00	1.00	1.00	0.700
	MVDMOC03	Sediments	4.50	1.00	2.80	0.600
	MVDMOC04	Sediments	2.00	1.00	1.00	0.800
	MVDMOC05	Sediments	6.80	1.00	3.10	0.500
Iron						
	MVDMOC01	Sediments	4730	10.0	3040	6.00
	MVDMOC02	Sediments	4280	10.0	3020	7.00
	MVDMOC03	Sediments	5690	10.0	3570	6.00
	MVDMOC04	Sediments	4150	10.0	3280	8.00
	MVDMOC05	Sediments	9240	10.0	4250	5.00
Mercury						
	MVDMOC01	Sediments	< 0.100	0.100	< 0.0600	0.0600

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC02	Sediments	< 0.100	0.100	< 0.0700	0.0700
	MVDMOC03	Sediments	< 0.100	0.100	< 0.0600	0.0600
	MVDMOC04	Sediments	< 0.100	0.100	< 0.0800	0.0800
	MVDMOC05	Sediments	< 0.100	0.100	< 0.0500	0.0500
Magnesium						
	MVDMOC01	Sediments	1120	10.0	723	6.00
	MVDMOC02	Sediments	940.	10.0	660.	7.00
	MVDMOC03	Sediments	1340	10.0	843	6.00
	MVDMOC04	Sediments	890.	10.0	700.	8.00
	MVDMOC05	Sediments	1980	10.0	910.	5.00
Manganese						
	MVDMOC01	Sediments	84.0	2.00	54.0	1.00
	MVDMOC02	Sediments	66.0	2.00	46.0	1.00
	MVDMOC03	Sediments	110.	2.00	69.0	1.00
	MVDMOC04	Sediments	70.0	2.00	55.0	2.00
	MVDMOC05	Sediments	225	2.00	104	0.900
Molybdenum						
	MVDMOC01	Sediments	< 5.00	5.00	< 3.00	3.00
	MVDMOC02	Sediments	< 5.00	5.00	< 4.00	4.00
	MVDMOC03	Sediments	< 5.00	5.00	< 3.00	3.00
	MVDMOC04	Sediments	< 5.00	5.00	< 4.00	4.00
	MVDMOC05	Sediments	< 5.00	5.00	< 2.00	2.00
Nickel						
	MVDMOC01	Sediments	< 5.00	5.00	< 3.00	3.00
	MVDMOC02	Sediments	< 5.00	5.00	< 4.00	4.00
	MVDMOC03	Sediments	5.00	5.00	3.00	3.00
	MVDMOC04	Sediments	< 5.00	5.00	< 4.00	4.00
	MVDMOC05	Sediments	7.00	5.00	3.00	2.00
Lead						

Analyte	Sample Number	Sample Matrix	Dry Weight (ppm)	DL Dry Weight (ppm)	Wet Weight (ppm)	DL Wet Weight (ppm)
	MVDMOC01	Sediments	7.00	5.00	4.00	3.00
	MVDMOC02	Sediments	7.00	5.00	5.00	4.00
	MVDMOC03	Sediments	10.0	5.00	7.00	3.00
	MVDMOC04	Sediments	< 5.00	5.00	< 4.00	4.00
	MVDMOC05	Sediments	10.0	5.00	6.30	2.00
Selenium						
	MVDMOC01	Sediments	< 0.500	0.500	< 0.300	0.300
	MVDMOC02	Sediments	< 0.500	0.500	< 0.400	0.400
	MVDMOC03	Sediments	< 0.500	0.500	< 0.300	0.300
	MVDMOC04	Sediments	< 0.500	0.500	< 0.400	0.400
	MVDMOC05	Sediments	< 0.500	0.500	< 0.200	0.200
Strontium						
	MVDMOC01	Sediments	5.40	1.00	3.50	0.600
	MVDMOC02	Sediments	4.70	1.00	3.30	0.700
	MVDMOC03	Sediments	6.20	1.00	3.90	0.600
	MVDMOC04	Sediments	3.80	1.00	3.00	0.800
	MVDMOC05	Sediments	12.0	1.00	5.40	0.500
Vanadium						
	MVDMOC01	Sediments	7.60	1.00	4.90	0.600
	MVDMOC02	Sediments	6.50	1.00	4.60	0.700
	MVDMOC03	Sediments	9.40	1.00	5.90	0.600
	MVDMOC04	Sediments	5.60	1.00	4.40	0.800
	MVDMOC05	Sediments	16.0	1.00	7.30	0.500
Zinc						
	MVDMOC01	Sediments	30.0	2.00	19.0	1.00
	MVDMOC02	Sediments	23.0	2.00	16.0	1.00
	MVDMOC03	Sediments	35.0	2.00	22.0	1.00
	MVDMOC04	Sediments	19.0	2.00	15.0	2.00
	MVDMOC05	Sediments	60.0	2.00	28.0	0.900

5. Procedural Blanks

Analyte	Lab Sample Number	Lab Sample Matrix	Result Total UG	** BEC (ppm/%)	Basis
Aluminum					
	Blank-1	Soil/Sediment	20.0	< 10.0	Dry
Arsenic					
	Blank-1	Soil/Sediment	1.00	< 0.500	Dry
Boron					
	Blank-1	Soil/Sediment	20.0	< 10.0	Dry
Barium					
	Blank-1	Soil/Sediment	1.00	< 0.500	Dry
Beryllium					
	Blank-1	Soil/Sediment	0.400	< 0.200	Dry
Cadmium					
	Blank-1	Soil/Sediment	0.400	< 0.200	Dry
Chromium					
	Blank-1	Soil/Sediment	2.00	< 1.00	Dry
Copper					
	Blank-1	Soil/Sediment	2.00	< 1.00	Dry
Iron					
	Blank-1	Soil/Sediment	20.0	< 10.0	Dry
Mercury					
	Blank-1	Soil/Sediment	0.200	< 0.100	Dry
Magnesium					
	Blank-1	Soil/Sediment	20.0	< 10.0	Dry
Manganese					
	Blank-1	Soil/Sediment	4.00	< 2.00	Dry
Molybdenum					
	Blank-1	Soil/Sediment	10.0	< 5.00	Dry
Nickel					
	Blank-1	Soil/Sediment	10.0	< 5.00	Dry
Lead					
	Blank-1	Soil/Sediment	10.0	< 5.00	Dry

Analyte	Lab Sample Number	Lab Sample Matrix	Result Total UG	** BEC (ppm/%)	Basis
Selenium					
	Blank-1	Soil/Sediment	1.00	< 0.500	Dry
Strontium					
	Blank-1	Soil/Sediment	2.00	< 1.00	Dry
Vanadium					
	Blank-1	Soil/Sediment	2.00	< 1.00	Dry
Zinc					
	Blank-1	Soil/Sediment	4.00	< 2.00	Dry

** Blank Equivalent Concentration

6. Duplicates

Analyte	Sample Number	Sample Matrix	Basis	Initial Result (ppm/%)	Duplicate Result (ppm/%)	Average	Relative Percent Diff.
% Moisture							
	MVDMOC02	Sediments	Percent	31.1	27.8	29.5	11.2
Aluminum							
	MVDMOC02	Sediments	Dry	3480	3340	3410	4.11
Arsenic							
	MVDMOC02	Sediments	Dry	2.30	2.70	2.50	16.0
Boron							
	MVDMOC02	Sediments	Dry	< 10.0	< 10.0	5.00	0.000
Barium							
	MVDMOC02	Sediments	Dry	20.0	19.0	19.5	5.13
Beryllium							
	MVDMOC02	Sediments	Dry	0.300	0.300	0.300	0.000
Cadmium							
	MVDMOC02	Sediments	Dry	< 0.200	< 0.200	0.100	0.000
Chromium							
	MVDMOC02	Sediments	Dry	5.10	4.80	4.95	6.06
Copper							
	MVDMOC02	Sediments	Dry	2.00	2.00	2.00	0.000
Iron							
	MVDMOC02	Sediments	Dry	4280	4070	4180	5.03
Mercury							
	MVDMOC02	Sediments	Dry	< 0.100	< 0.100	0.0500	0.000
Magnesium							
	MVDMOC02	Sediments	Dry	940.	870.	905	7.73
Manganese							
	MVDMOC02	Sediments	Dry	66.0	62.0	64.0	6.25
Molybdenum							
	MVDMOC02	Sediments	Dry	< 5.00	< 5.00	2.50	0.000
Nickel							
	MVDMOC02	Sediments	Dry	< 5.00	< 5.00	2.50	0.000

Analyte	Sample Number	Sample Matrix	Basis	Initial Result (ppm/%)	Duplicate Result (ppm/%)	Average	Relative Percent Diff.
Lead							
	MVDMOC02	Sediments	Dry	7.00	6.00	6.50	15.4
Selenium							
	MVDMOC02	Sediments	Dry	< 0.500	< 0.500	0.250	0.000
Strontium							
	MVDMOC02	Sediments	Dry	4.70	4.30	4.50	8.89
Vanadium							
	MVDMOC02	Sediments	Dry	6.50	5.90	6.20	9.68
Zinc							
	MVDMOC02	Sediments	Dry	23.0	23.0	23.0	0.000

7. Spike Recoveries

Analyte	Sample Number	Sample Matrix	Basis	Spike Level (ppm/%)	Amount Recovered (ppm/%)	*** Spike Background	Percent Recovery
Aluminum							
	MVDMOC04	Sediments	Dry	1980	2190	0.640	111
Arsenic							
	MVDMOC04	Sediments	Dry	39.6	38.6	16.5	97.5
Boron							
	MVDMOC04	Sediments	Dry	990.	1040	198	106
Barium							
	MVDMOC04	Sediments	Dry	39.6	42.4	2.48	107
Beryllium							
	MVDMOC04	Sediments	Dry	19.8	18.7	66.0	94.4
Cadmium							
	MVDMOC04	Sediments	Dry	19.8	19.9	198	101
Chromium							
	MVDMOC04	Sediments	Dry	99.0	97.7	23.0	98.7
Copper							
	MVDMOC04	Sediments	Dry	99.0	102	49.5	103
Iron							
	MVDMOC04	Sediments	Dry	1980	1790	0.480	90.4
Mercury							
	MVDMOC04	Sediments	Dry	3.97	4.05	79.4	102
Magnesium							
	MVDMOC04	Sediments	Dry	792	790.	0.890	99.8
Manganese							
	MVDMOC04	Sediments	Dry	198	201	2.83	102
Molybdenum							
	MVDMOC04	Sediments	Dry	396	358	158	90.3
Nickel							
	MVDMOC04	Sediments	Dry	396	398	158	100.
Lead							

Analyte	Sample Number	Sample Matrix	Basis	Spike Level (ppm/%)	Amount Recovered (ppm/%)	*** Spike Background	Percent Recovery
	MVDMOC04	Sediments	Dry	396	398	158	100.
Selenium							
	MVDMOC04	Sediments	Dry	39.6	41.8	158	105
Strontium							
	MVDMOC04	Sediments	Dry	99.0	102	26.0	103
Vanadium							
	MVDMOC04	Sediments	Dry	99.0	96.4	17.7	97.4
Zinc							
	MVDMOC04	Sediments	Dry	198	198	10.4	100.

*** For a spike to be a valid measure of method accuracy, this ratio must be higher than 1.0.

8. Reference Materials

Analyte	Lab Sample Number	S.R.M. ID	Basis	Certified Reference Value	95% Confidence Interval	Result (ppm/%)	Percent Recovery
Aluminum							
	MVDMOC06	NIST 2704	Dry	61100	1600	15200	24.9
Arsenic							
	MVDMOC06	NIST 2704	Dry	23.4	0.8	21.0	89.7
Boron							
	MVDMOC06	NIST 2704	Dry			10.0	
Barium							
	MVDMOC06	NIST 2704	Dry	414	12	94.6	22.8
Beryllium							
	MVDMOC06	NIST 2704	Dry			0.800	
Cadmium							
	MVDMOC06	NIST 2704	Dry	3.45	0.22	3.80	110.
Chromium							
	MVDMOC06	NIST 2704	Dry	135	5	92.0	68.2
Copper							
	MVDMOC06	NIST 2704	Dry	98.6	5	95.0	96.4
Iron							
	MVDMOC06	NIST 2704	Dry	41100	1000	31800	77.4
Mercury							
	MVDMOC06	NIST 2704	Dry	1.44	0.07	1.40	97.2
Magnesium							
	MVDMOC06	NIST 2704	Dry	12000	200	9020	75.2
Manganese							
	MVDMOC06	NIST 2704	Dry	555	19	487	87.8
Molybdenum							
	MVDMOC06	NIST 2704	Dry			< 5.00	
Nickel							
	MVDMOC06	NIST 2704	Dry	44.1	3	39.0	88.4
Lead							

Analyte	Lab Sample Number	S.R.M. ID	Basis	Certified Reference Value	95% Confidence Interval	Result (ppm/%)	Percent Recovery
	MVDMOC06	NIST 2704	Dry	161	17	160.	99.4
Selenium							
	MVDMOC06	NIST 2704	Dry	1.1		1.00	
Strontium							
	MVDMOC06	NIST 2704	Dry	130		37.0	
Vanadium							
	MVDMOC06	NIST 2704	Dry	95	4	27.0	28.4
Zinc							
	MVDMOC06	NIST 2704	Dry	438	12	406	92.7

S.R.M Names

SRM ID	SRM Name
NIST 2704	Buffalo River Sediment

10. QAQC Summary

1. Procedural Blank Summary

Procedural Blank Summary of Blank Equivalent Concentration (BEC) Data

Within a lab sample matrix, there must be three or more Blank results for a given analyte in order to generate a report.

10.2. Duplicate Summary

Duplicate Summary of Relative Percent Difference (RPD) Data

Within a lab sample matrix and concentration range, there must be three or more Duplicate results for a given analyte in order to generate a report.

10.3. Spike Summary

Spike Summary of Percent Recovery (PR) Data

Within a lab sample matrix, there must be three or more Spike results for a given analyte in order to generate a report.

10.4. SRM Summary

Standard Reference Material Summary of Percent Recovery (PR) Data

Within an SRM ID, there must be three or more Recoveries for a given analyte in order to generate a report.

11. QA/QC Anomalies

1. Blank Frequency Anomalies

The required number of blank analyses were performed.

11.2. Duplicate Frequency Anomalies

The required number of duplicate analyses were performed.

11.3. Spike Frequency Anomalies

The required number of spike analyses were performed.

11.4. Reference Material Frequency Anomalies

The required number of Standard Reference Material analyses were performed.

11.5. Mass Spec Frequency Anomalies

No Carbamate, OC, or OP data exists in this set of results; therefore, the anomaly test was not performed.

11.6. Limit of Detection Anomalies

Limits of Detection were within the contract requirements.

11.7. Blank Anomalies

Procedural Blank analyses were acceptable.

11.8. Duplicate Anomalies

All duplicate results were within normal limits.

11.9. Spike Anomalies

All spike results were within normal limits.

11.10. S.R.M. Anomalies

All SRM results were within normal limits with the following exceptions.

Analyte	S.R.M. ID	Certified Value	LOD (ppm/%)	Result (ppm/%)	% Recovery	See QA/QC Note No.
Strontium	NIST 2704	130.	1.00	37.0	28.5	1

S.R.M Names

SRM ID	SRM Name
NIST 2704	Buffalo River Sediment

11.11. QA/QC Notes

QA/QC Note Number and Comments
1 Recovery of Sr from the SRM was slightly low. This should have no effect on the interpretation of the data.

12. Analytical Methods

Below are the analytical methods used by LET to produce the results included in this report.

Method Codes:	001 002

Lab Matrix	Analyte
Soil/Sediment	% Moisture

Method Code: 001

LABORATORY: Laboratory and Environmental Testing, Inc.

Homogenization

1. Sample homogenization will depend on the sample type and size.

2. Water samples will not need to be homogenized.

3. For samples weighing less than 100 grams the whole sample will be freeze-dried first, and then homogenized, unless aliquots are being sent for Organic determination, then the sample would be homogenized first and an aliquot taken for freeze-drying.

4. Larger animal samples will be homogenized with a meat grinder. Then an aliquot of approximately 100 grams will be freeze-dried and then further homogenized using a blender, or if necessary, a Spex mixer mill with a Tungsten Carbide vial and ball.

5. Soil and Sediment samples will be mixed and aliquots of 100-200 grams taken for freeze-drying. After freeze-drying, soils will be sieved with a 20 mesh sieve and sediments will be sieved with a 10 mesh sieve followed by grinding with a Spex mixer mill, using a Tungsten Carbide vial and ball.

6. Plant samples will be freeze-dried and then homogenized with a blender, followed if necessary by grinding in a Spex mixer mill with a Tungsten Carbide vial and ball. If aliquots are

being sent for Organic determinations, then the samples will be homogenized first, followed by freeze-drying, and further homogenization.

Method Code: 002

LABORATORY: Laboratory and Environmental Testing, Inc.

L9 - Freeze drying and % Moisture

1. Choose an appropriately sized container for the sample. Usually a Whirl-Pak works best for tissue samples. If the sample weighs less than 50 grams and is not being split for organics then use the whole sample.

2. Weigh and record the weight of the bag. If the sample weighs more than 2 grams then a three-place balance should be used. Small samples may require the use of a four or five-place balance.

3. Weight the bag, record the weight and transfer the sample to the bag. Weigh the bag and sample and record the weight. Seal the container or bag and place in a freezer at least overnight or until frozen solid.

4. After the samples are frozen, they are ready to place in the freeze-drier. Turn on the freeze-drier and start the refrigeration. When the temperature reaches -50 C open the container or Whirl-Pak and place in the chamber of the freeze-drier. Close the chamber and start the vacuum pump.

5. Depending on the number of samples and the amount of water present freeze-drying may take 1 - 5 days. When the pressure stops going lower, the samples may be done. If, upon removal, the samples are still cold, place back in the freeze-drier for a longer period of time.

6. After the samples are dry, remove them from the chamber. Then seal the container and weigh on the same balance. Record the weight of the bag and dry sample.

7. Calculate the weight of the dry sample and the weight of the wet sample. To calculate % Moisture divide the weight of the dry sample by the weight of the wet sample, subtract 1 and multiply by 100. Ignore the - sign.

Notes:

1. If the samples do not require % Moisture, then all of the weighing steps can be eliminated.

Method Codes:	001 002 007 012

Lab Matrix	Analyte
Soil/Sediment	Arsenic
	Selenium

Method Code: 001

LABORATORY: Laboratory and Environmental Testing, Inc.

Homogenization

1. Sample homogenization will depend on the sample type and size.

2. Water samples will not need to be homogenized.

3. For samples weighing less than 100 grams the whole sample will be freeze-dried first, and then homogenized, unless aliquots are being sent for Organic determination, then the sample would be homogenized first and an aliquot taken for freeze-drying.

4. Larger animal samples will be homogenized with a meat grinder. Then an aliquot of approximately 100 grams will be freeze-dried and then further homogenized using a blender, or if necessary, a Spex mixer mill with a Tungsten Carbide vial and ball.

5. Soil and Sediment samples will be mixed and aliquots of 100-200 grams taken for freeze-drying. After freeze-drying, soils will be sieved with a 20 mesh sieve and sediments will be sieved with a 10 mesh sieve followed by grinding with a Spex

mixer mill, using a Tungsten Carbide vial and ball.

6. Plant samples will be freeze-dried and then homogenized with a blender, followed if necessary by grinding in a Spex mixer mill with a Tungsten Carbide vial and ball. If aliquots are being sent for Organic determinations, then the samples will be homogenized first, followed by freeze-drying, and further homogenization.

Method Code: 002

LABORATORY: Laboratory and Environmental Testing, Inc.

L9 - Freeze drying and % Moisture

1. Choose an appropriately sized container for the sample. Usually a Whirl-Pak works best for tissue samples. If the sample weighs less than 50 grams and is not being split for organics then use the whole sample.

2. Weigh and record the weight of the bag. If the sample weighs more than 2 grams then a three-place balance should be used. Small samples may require the use of a four or five-place balance.

3. Weight the bag, record the weight and transfer the sample to the bag. Weigh the bag and sample and record the weight. Seal the container or bag and place in a freezer at least overnight or until frozen solid.

4. After the samples are frozen, they are ready to place in the freeze-drier. Turn on the freeze-drier and start the refrigeration. When the temperature reaches -50 C open the container or Whirl-Pak and place in the chamber of the freeze-drier. Close the chamber and start the vacuum pump.

5. Depending on the number of samples and the amount of water present freeze-drying may take 1 - 5 days. When the pressure stops going lower, the samples may be done. If, upon removal, the samples are still cold, place back in the freeze-drier for a longer period of time.

6. After the samples are dry, remove them from the chamber. Then seal the container and weigh on the same balance. Record the weight of the bag and dry sample.

7. Calculate the weight of the dry sample and the weight of the wet sample. To calculate % Moisture divide the weight of the dry sample by the weight of the wet sample, subtract 1 and multiply by 100. Ignore the - sign.

Notes:

1. If the samples do not require % Moisture, then all of the weighing steps can be eliminated.

Method Code: 007

LABORATORY: Laboratory and Environmental Testing, Inc.

L5 - Magnesium Dry Ash

1. Weigh 0.5 g. of sample on a three-place balance and transfer to a cleaned 100 ml. glass beaker with etched numbers. Record the beaker number as well as the sample weight.

2. Wet with 3 ml. of methanol. Then add 5 drops of anti-foam agent, 10 ml. of 40% (W/V) Magnesium Nitrate Hexahydrate, 10 ml. of concentrated trace metal grade HNO3 and 2 ml. of concentrated trace metal grade HCl.

3. Cover with a watch glass and reflux on a hot plate overnight (8-12 hours) at low heat (70-80 C).

4. After reflux increase temperature to 200 C. Slide the watch glass to the side to allow for faster evaporation and cook to complete dryness. This may take 8-12 hours.

5. When no moisture is visible, cover fully with the watch glass and allow to cool.

6. Transfer samples to the cold muffle furnace and use the following program: Start at 250 C and ramp to 500 C at a rate of 1 degree per minute. When 500 C is reached hold for 3 hours then turn off and allow samples to cool to room temperature.

7. Place the cooled samples on a hot plate and add 20 ml. of 50% trace metal grade HCl. Allow the samples to gently boil for 1 hour. After 1 hour readjust volume to 20 ml. with 50 % HCl. Do not allow the samples to go dry. If necessary add more 50

% HCl during the heating.

8. Allow the samples to cool. Then dilute to 50.0 ml. with D.I. water and transfer to a clean 2 oz. labeled bottle.

Notes:

1. This digestion can be used for As or Se by Hydride Generation AA.

2. This digestion must be used on fish for As by Hydride Generation AA.

Method Code: 012

LABORATORY: Laboratory and Environmental Testing, Inc.

Hydride Generation AA

Turn on the computer, printer, 3100, FIAS 200.and Argon. Place the appropriate lamp in the instrument and if an EDL turn to its required power. Place the furnace in the burner compartment if it is not already present.

When the computer is ready double click on the WinLab Analyst icon. If the technique is not already FI-Hydride then click on technique and change to FI-Hydride. After the computer has confirmed the IEEE connections are OK, click on Workspace and double click fias.fms. When the screens come up double click on the method and double click on either the Se-Fias or As-Fias method. Click on FIAS and turn on the cell.

When the lamp has had time to warm up click on lamps and enter the element and click on EDL. Check lamp alignment and wavelength to give the maximum signal. Close lamps.

Prepare the 10% HCl, 0.2% NaBH4-0.05% NaOH, Calibration standards, and check standards. Change the FIAS tubing and mixing cell if it is not already the set for this element. Change the position of the tubing or new tubes, if both positions have been used.

Check the alignment of the furnace in the light path by clicking on Tools and Continuous graphics. Autozero, then check all three positional knobs to get the lowest reading. Autozero whenever necessary.

Start the pumps and place the tubes in the HCl and Borohydride. Run a 5 or 10 PPB standard until the sensitivity has stabilized and consecutive readings vary by less than 2%.

Enter the samples to be run into the Sample Information File. Enter a name for the Data file, and make sure that print log and store data are checked. When the instrument is ready click on Analyze All.

Calibration is done with 0, 1.0, 5.0, 15.0 PPB. QC checks are 10.0 and a known Reference sample (Usually ERA). The 5.00 PPB standard is checked every 10 tubes and if is more than 5% from 5.00 the instrument is recalibrated. If the value is more than 10% from 5.00, then the last 10 samples must be rerun.

After the analysis is finished, rinse system with D.I. water, turn off the pumps (release the pressure), turn off the EDL lamp, the Argon, FIAS and 3100. Click on File then Exit to close the WinLabs Analyst.

Click on WinLab Reformat Icon. Click on Open Design. Pick the design for As or Se FIAS. Then Browse and find the file name given the data. Place a 3.5" disk in the computer and click on Save Results.

Transfer disk to computer and using Excel calculate the results.

Method Codes:	001 002 009 013

Lab Matrix	**Analyte**
Soil/Sediment	Mercury

Method Code: 001

LABORATORY: Laboratory and Environmental Testing, Inc.

Homogenization

1. Sample homogenization will depend on the sample type and size.

2. Water samples will not need to be homogenized.

3. For samples weighing less than 100 grams the whole sample will be freeze-dried first, and then homogenized, unless aliquots are being sent for Organic determination, then the sample would be homogenized first and an aliquot taken for freeze-drying.

4. Larger animal samples will be homogenized with a meat grinder. Then an aliquot of approximately 100 grams will be freeze-dried and then further homogenized using a blender, or if necessary, a Spex mixer mill with a Tungsten Carbide vial and ball.

5. Soil and Sediment samples will be mixed and aliquots of 100-200 grams taken for freeze-drying. After freeze-drying, soils will be sieved with a 20 mesh sieve and sediments will be

sieved with a 10 mesh sieve followed by grinding with a Spex mixer mill, using a Tungsten Carbide vial and ball.

6. Plant samples will be freeze-dried and then homogenized with a blender, followed if necessary by grinding in a Spex mixer mill with a Tungsten Carbide vial and ball. If aliquots are being sent for Organic determinations, then the samples will be homogenized first, followed by freeze-drying, and further homogenization.

Method Code: 002

LABORATORY: Laboratory and Environmental Testing, Inc.

L9 - Freeze drying and % Moisture

1. Choose an appropriately sized container for the sample. Usually a Whirl-Pak works best for tissue samples. If the sample weighs less than 50 grams and is not being split for organics then use the whole sample.

2. Weigh and record the weight of the bag. If the sample weighs more than 2 grams then a three-place balance should be used. Small samples may require the use of a four or five-place balance.

3. Weight the bag, record the weight and transfer the sample to the bag. Weigh the bag and sample and record the weight. Seal the container or bag and place in a freezer at least overnight or until frozen solid.

4. After the samples are frozen, they are ready to place in the freeze-drier. Turn on the freeze-drier and start the refrigeration. When the temperature reaches -50 C open the container or Whirl-Pak and place in the chamber of the freeze-drier. Close the chamber and start the vacuum pump.

5. Depending on the number of samples and the amount of water present freeze-drying may take 1 - 5 days. When the pressure stops going lower, the samples may be done. If, upon removal, the samples are still cold, place back in the freeze-drier for a longer period of time.

6. After the samples are dry, remove them from the chamber. Then seal the container and weigh on the same balance.

Record the weight of the bag and dry sample.

7. Calculate the weight of the dry sample and the weight of the wet sample. To calculate % Moisture divide the weight of the dry sample by the weight of the wet sample, subtract 1 and multiply by 100. Ignore the - sign.

Notes:

1. If the samples do not require % Moisture, then all of the weighing steps can be eliminated.

Method Code: 009

LABORATORY: Laboratory and Environmental Testing, Inc.

L10 - Microwave Digestion

1. Weigh 0.5 g of dry sample into a clean Teflon digestion vessel. Record the weight to three decimal places.

2. Add 5.0 ml. of concentrated trace metal grade HNO3.

3. Loosely seal to allow release of pressure from the initial acid reaction with the sample.

4. After a few minutes open the vessel and add 1.0 ml of high purity H2O2.

5. Loosely seal the vessel to allow release of pressure.

6. Cap the vessel at the recommended pressure and place in the microwave. Run the program set up for this type of sample.

7. After the microwave heating is complete and the samples have cooled to room temperature, open the vessels and dilute the sample to 50.0 ml. with D.I. water and transfer to a clean 2 oz. plastic bottle. Any vessels that vented during the digestion will need to have the sample redigested and either use less sample or a longer ramp at the lower temperatures.

Notes:

1. Different sample types will require different heating programs to prevent losses due to exceeding the maximum vessel

pressure.

2. To keep the same sample dilution, as little as 0.25 g of sample can be weighed and diluted to a final volume of 25.0 ml. using 1/2 of the HNO3 and H2O2.

3. This digestion can be used for Flame AA, HGA, CV, and ICP.

4. If Mercury is to be run, remove a 10 ml aliquot immediately after dilution and place in a plastic tube and add 100 microliters of concentrated Trace Metal grade Hydrochloric Acid.

Method Code: 013

LABORATORY: Laboratory and Environmental Testing, Inc.

Cold Vapor AA

Turn on the computer, printer, 3100, FIAS 200,and Argon. Place the appropriate lamp in the instrument and if an EDL turn to its required power. Place the furnace in the burner compartment if it is not already present.

When the computer is ready double click on the WinLab Analyst icon. If the technique is not already FI-Hydride then click on technique and change to FI-Hydride. After the computer has confirmed the IEEE connections are OK, click on Workspace and double click fias.fms. When the screens come up double click on the method and double click on the Hg-CV method. Click on FIAS and turn on the cell.

When the lamp has had time to warm up click on lamps and enter the Hg and click on EDL. Check lamp alignment and wavelength to give the maximum signal. Close lamps.

Prepare the 10% HCl, 5% Stanous Chloride-10% HCl, Calibration standards, and check standards. Change the FIAS tubing and mixing cell if it is not already the set for Mercury. Change the position of the tubing or new tubes, if both positions have been used or determining a different element.

Check the alignment of the furnace in the light path by clicking on Tools and Continuous graphics. Autozero, then check all three positional knobs to get the lowest reading. Autozero whenever necessary.

Start the pumps and place the tubes in the HCl and Stanous Chloride. Run a 10 or 20 PPB standard until the sensitivity has stabilized and consecutive readings vary by less the 2%.

Enter the samples to be run into the Sample Information File. Enter a name for the Data file, and make sure that print log and store data are checked. When the instrument is ready click on Analyze All.

Calibration is done with 0, 1.0, 5.0, 30.0 PPB. QC checks are 10.0, 20.0 and a known Reference Sample(Usually ERA). The 5.00 PPB standard is checked every 10 tubes and if is more than 5% from 5.00 the instrument is recalibrated. If the value is more than 10% from 5.00, then the last 10 samples must be rerun.

After the analysis is finished, rinse system with D.I. water, turn off the pumps (release the pressure), turn off the EDL lamp, the Argon, FIAS and 3100. Click on File then Exit to close the WinLabs Analyst.

Click on WinLab Reformat Icon. Click on Open Design. Pick the design for Hg-CV. Then Browse and find the file name given the data. Place a 3.5" disk in the computer and click on Save Results.

Transfer disk to computer and using Excel calculate the results.

Method Codes:	001 002 009 018

Lab Matrix	**Analyte**
Soil/Sediment	Aluminum
	Boron
	Barium
	Beryllium
	Cadmium
	Chromium
	Copper
	Iron
	Magnesium
	Manganese
	Molybdenum
	Nickel
	Lead
	Strontium
	Vanadium
	Zinc

Method Code: 001

LABORATORY: Laboratory and Environmental Testing, Inc.

Homogenization

1. Sample homogenization will depend on the sample type and size.

2. Water samples will not need to be homogenized.

3. For samples weighing less than 100 grams the whole sample will be freeze-dried first, and then homogenized, unless aliquots are being sent for Organic determination, then the sample would be homogenized first and an aliquot taken for freeze-drying.

4. Larger animal samples will be homogenized with a meat grinder. Then an aliquot of approximately 100 grams will be freeze-dried and then further homogenized using a blender, or if necessary, a Spex mixer mill with a Tungsten Carbide vial and ball.

5. Soil and Sediment samples will be mixed and aliquots of 100-200 grams taken for freeze-drying. After freeze-drying, soils will be sieved with a 20 mesh sieve and sediments will be sieved with a 10 mesh sieve followed by grinding with a Spex mixer mill, using a Tungsten Carbide vial and ball.

6. Plant samples will be freeze-dried and then homogenized with a blender, followed if necessary by grinding in a Spex mixer mill with a Tungsten Carbide vial and ball. If aliquots are being sent for Organic determinations, then the samples will be homogenized first, followed by freeze-drying, and further homogenization.

Method Code: 002

LABORATORY: Laboratory and Environmental Testing, Inc.

L9 - Freeze drying and % Moisture

1. Choose an appropriately sized container for the sample. Usually a Whirl-Pak works best for tissue samples. If the sample weighs less than 50 grams and is not being split for organics then use the whole sample.

2. Weigh and record the weight of the bag. If the sample weighs more than 2 grams then a three-place balance should be used. Small samples may require the use of a four or five-place balance.

3. Weight the bag, record the weight and transfer the sample to the bag. Weigh the bag and sample and record the weight. Seal the container or bag and place in a freezer at least overnight or until frozen solid.

4. After the samples are frozen, they are ready to place in the freeze-drier. Turn on the freeze-drier and start the refrigeration. When the temperature reaches -50 C open the container or Whirl-Pak and place in the chamber of the freeze-drier. Close the chamber and start the vacuum pump.

5. Depending on the number of samples and the amount of water present freeze-drying may take 1 - 5 days. When the pressure stops going lower, the samples may be done. If, upon removal, the samples are still cold, place back in the freeze-drier for a longer period of time.

6. After the samples are dry, remove them from the chamber. Then seal the container and weigh on the same balance. Record the weight of the bag and dry sample.

7. Calculate the weight of the dry sample and the weight of the wet sample. To calculate % Moisture divide the weight of the dry sample by the weight of the wet sample, subtract 1 and multiply by 100. Ignore the - sign.

Notes:

1. If the samples do not require % Moisture, then all of the weighing steps can be eliminated.

Method Code: 009

LABORATORY: Laboratory and Environmental Testing, Inc.

L10 - Microwave Digestion

1. Weigh 0.5 g of dry sample into a clean Teflon digestion vessel. Record the weight to three decimal places.

2. Add 5.0 ml. of concentrated trace metal grade HNO3.

3. Loosely seal to allow release of pressure from the initial acid reaction with the sample.

4. After a few minutes open the vessel and add 1.0 ml of high purity H_2O_2.

5. Loosely seal the vessel to allow release of pressure.

6. Cap the vessel at the recommended pressure and place in the microwave. Run the program set up for this type of sample.

7. After the microwave heating is complete and the samples have cooled to room temperature, open the vessels and dilute the sample to 50.0 ml. with D.I. water and transfer to a clean 2 oz. plastic bottle. Any vessels that vented during the digestion will need to have the sample redigested and either use less sample or a longer ramp at the lower temperatures.

Notes:

1. Different sample types will require different heating programs to prevent losses due to exceeding the maximum vessel pressure.

2. To keep the same sample dilution, as little as 0.25 g of sample can be weighed and diluted to a final volume of 25.0 ml. using 1/2 of the HNO_3 and H_2O_2.

3. This digestion can be used for Flame AA, HGA, CV, and ICP.

4. If Mercury is to be run, remove a 10 ml aliquot immediately after dilution and place in a plastic tube and add 100 microliters of concentrated Trace Metal grade Hydrochloric Acid.

Method Code: 018

LABORATORY: Laboratory and Environmental Testing, Inc.

ICP on Perkin-Elmer 4300 DV

Make sure the instrument, Chiller, Air compressor, and gases are on, and at the proper temperatures and pressures. Turn on the computer and double click on the WinLAb32 icon.

Prepare standards and check samples to match the acid matrix of the samples to be analyzed. Change the pump tubing.

Click on "file", then "Open", and then "Method". Click on the method to be used and then click "OK", TO start the ICP program and call up the Method with the elements to be determined.

Click on the Plasma icon, and click on pump to start the pump and make sure the tubes are in the pump properly. Start the plasma by clicking the "On" icon. Click on the X in the upper right corner to close the Plasma Control. Allow the instrument to warm-up while the samples and standards are loaded into the auto-sampler racks. If the Sample Info table was not filled out previously, then fill in the sample information and save the table using the Batch ID.

Before starting the run, check the Hg wavelength by clicking on "Tools", and then "Spectrometer Control". Click on Hg Realign. When that is complete, aspirate a 10.0 Mn Standard and click on "Align View". After Align View is completed, close the box.

When ready to start analysis, click on the "Auto" icon, make sure that the data is being stored in a file with the correct name for the Batch, and that the right method is being used. Click the "Analyze" icon and click on "Analyze All".

When the run is completed, click on "File", then "Utilities", then "Data Manager". Highlight the file, and then click on "Export" icon. Click "Use Existing Design". Click "Browse" and choose the appropriate template (usually LET-ICP). Click "Open", place a disk in the "A" drive, and click "Finish". Click on "Export Data" to transfer data to disk in Drive "A".

Transfer data to the main computer and calculate the final Concentrations.

Method Codes:	007 012

Lab Matrix	**Analyte**
Soil/Sediment	Arsenic
	Selenium

Method Code: 007

LABORATORY: Laboratory and Environmental Testing, Inc.

L5 - Magnesium Dry Ash

1. Weigh 0.5 g. of sample on a three-place balance and transfer to a cleaned 100 ml. glass beaker with etched numbers. Record the beaker number as well as the sample weight.

2. Wet with 3 ml. of methanol. Then add 5 drops of anti-foam agent, 10 ml. of 40% (W/V) Magnesium Nitrate Hexahydrate, 10 ml. of concentrated trace metal grade HNO3 and 2 ml. of concentrated trace metal grade HCl.

3. Cover with a watch glass and reflux on a hot plate overnight (8-12 hours) at low heat (70-80 C).

4. After reflux increase temperature to 200 C. Slide the watch glass to the side to allow for faster evaporation and cook to complete dryness. This may take 8-12 hours.

5. When no moisture is visible, cover fully with the watch glass and allow to cool.

6. Transfer samples to the cold muffle furnace and use the following program: Start at 250 C and ramp to 500 C at a rate of 1 degree per minute. When 500 C is reached hold for 3 hours then turn off and allow samples to cool to room temperature.

7. Place the cooled samples on a hot plate and add 20 ml. of 50% trace metal grade HCl. Allow the samples to gently boil for 1 hour. After 1 hour readjust volume to 20 ml. with 50 % HCl. Do not allow the samples to go dry. If necessary add more 50 % HCl during the heating.

8. Allow the samples to cool. Then dilute to 50.0 ml. with D.I. water and transfer to a clean 2 oz. labeled bottle.

Notes:

1. This digestion can be used for As or Se by Hydride Generation AA.

2. This digestion must be used on fish for As by Hydride Generation AA.

Method Code: 012

LABORATORY: Laboratory and Environmental Testing, Inc.

Hydride Generation AA

Turn on the computer, printer, 3100, FIAS 200.and Argon. Place the appropriate lamp in the instrument and if an EDL turn to its required power. Place the furnace in the burner compartment if it is not already present.

When the computer is ready double click on the WinLab Analyst icon. If the technique is not already FI-Hydride then click on technique and change to FI-Hydride. After the computer has confirmed the IEEE connections are OK, click on Workspace and double click fias.fms. When the screens come up double click on the method and double click on either the Se-Fias or As-Fias method. Click on FIAS and turn on the cell.

When the lamp has had time to warm up click on lamps and enter the element and click on EDL. Check lamp alignment and wavelength to give the maximum signal. Close lamps.

Prepare the 10% HCl, 0.2% NaBH4-0.05% NaOH, Calibration standards, and check standards. Change the FIAS tubing and mixing cell if it is not already the set for this element. Change the position of the tubing or new tubes, if both positions have been used.

Check the alignment of the furnace in the light path by clicking on Tools and Continuous graphics. Autozero, then check all three positional knobs to get the lowest reading. Autozero whenever necessary.

Start the pumps and place the tubes in the HCl and Borohydride. Run a 5 or 10 PPB standard until the sensitivity has stabilized and consecutive readings vary by less than 2%.

Enter the samples to be run into the Sample Information File. Enter a name for the Data file, and make sure that print log and store data are checked. When the instrument is ready click on Analyze All.

Calibration is done with 0, 1.0, 5.0, 15.0 PPB. QC checks are 10.0 and a known Reference sample (Usually ERA). The 5.00 PPB standard is checked every 10 tubes and if is more than 5% from 5.00 the instrument is recalibrated. If the value is more than 10% from 5.00, then the last 10 samples must be rerun.

After the analysis is finished, rinse system with D.I. water, turn off the pumps (release the pressure), turn off the EDL lamp, the Argon, FIAS and 3100. Click on File then Exit to close the WinLabs Analyst.

Click on WinLab Reformat Icon. Click on Open Design. Pick the design for As or Se FIAS. Then Browse and find the file name given the data. Place a 3.5" disk in the computer and click on Save Results.

Transfer disk to computer and using Excel calculate the results.

Method Codes:	009 013

Lab Matrix	**Analyte**
Soil/Sediment	Mercury

Method Code: 009

LABORATORY: Laboratory and Environmental Testing, Inc.

L10 - Microwave Digestion

1. Weigh 0.5 g of dry sample into a clean Teflon digestion vessel.

Record the weight to three decimal places.

2. Add 5.0 ml. of concentrated trace metal grade HNO3.

3. Loosely seal to allow release of pressure from the initial acid reaction with the sample.

4. After a few minutes open the vessel and add 1.0 ml of high purity H2O2.

5. Loosely seal the vessel to allow release of pressure.

6. Cap the vessel at the recommended pressure and place in the microwave. Run the program set up for this type of sample.

7. After the microwave heating is complete and the samples have cooled to room temperature, open the vessels and dilute the sample to 50.0 ml. with D.I. water and transfer to a clean 2 oz. plastic bottle. Any vessels that vented during the digestion will need to have the sample redigested and either use less sample or a longer ramp at the lower temperatures.

Notes:

1. Different sample types will require different heating programs to prevent losses due to exceeding the maximum vessel pressure.

2. To keep the same sample dilution, as little as 0.25 g of sample can be weighed and diluted to a final volume of 25.0 ml. using 1/2 of the HNO3 and H2O2.

3. This digestion can be used for Flame AA, HGA, CV, and ICP.

4. If Mercury is to be run, remove a 10 ml aliquot immediately after dilution and place in a plastic tube and add 100 microliters of concentrated Trace Metal grade Hydrochloric Acid.

Method Code: 013

LABORATORY: Laboratory and Environmental Testing, Inc.

Cold Vapor AA

Turn on the computer, printer, 3100, FIAS 200,and Argon. Place the appropriate lamp in the instrument and if an EDL turn to its

required power. Place the furnace in the burner compartment if it is not already present.

When the computer is ready double click on the WinLab Analyst icon. If the technique is not already FI-Hydride then click on technique and change to FI-Hydride. After the computer has confirmed the IEEE connections are OK, click on Workspace and double click fias.fms. When the screens come up double click on the method and double click on the Hg-CV method. Click on FIAS and turn on the cell.

When the lamp has had time to warm up click on lamps and enter the Hg and click on EDL. Check lamp alignment and wavelength to give the maximum signal. Close lamps.

Prepare the 10% HCl, 5% Stanous Chloride-10% HCl, Calibration standards, and check standards. Change the FIAS tubing and mixing cell if it is not already the set for Mercury. Change the position of the tubing or new tubes, if both positions have been used or determining a different element.

Check the alignment of the furnace in the light path by clicking on Tools and Continuous graphics. Autozero, then check all three positional knobs to get the lowest reading. Autozero whenever necessary.

Start the pumps and place the tubes in the HCl and Stanous Chloride. Run a 10 or 20 PPB standard until the sensitivity has stabilized and consecutive readings vary by less the 2%.

Enter the samples to be run into the Sample Information File. Enter a name for the Data file, and make sure that print log and store data are checked. When the instrument is ready click on Analyze All.

Calibration is done with 0, 1.0, 5.0, 30.0 PPB. QC checks are 10.0, 20.0 and a known Reference Sample(Usually ERA). The 5.00 PPB standard is checked every 10 tubes and if is more than 5% from 5.00 the instrument is recalibrated. If the value is more than 10% from 5.00, then the last 10 samples must be rerun.

After the analysis is finished, rinse system with D.I. water, turn off the pumps (release the pressure), turn off the EDL lamp, the Argon, FIAS and 3100. Click on File then Exit to close the WinLabs Analyst.

Click on WinLab Reformat Icon. Click on Open Design. Pick the design for Hg-CV. Then Browse and find the file name given the data. Place a 3.5" disk in the computer and click on Save Results.

Transfer disk to computer and using Excel calculate the results.

Method Codes:	009 018

Lab Matrix	**Analyte**
Soil/Sediment	Aluminum
	Boron

Barium
Beryllium
Cadmium
Chromium
Copper
Iron
Magnesium
Manganese
Molybdenum
Nickel
Lead
Strontium
Vanadium
Zinc

Method Code: 009

LABORATORY: Laboratory and Environmental Testing, Inc.

L10 - Microwave Digestion

1. Weigh 0.5 g of dry sample into a clean Teflon digestion vessel. Record the weight to three decimal places.

2. Add 5.0 ml. of concentrated trace metal grade HNO3.

3. Loosely seal to allow release of pressure from the initial acid reaction with the sample.

4. After a few minutes open the vessel and add 1.0 ml of high purity H2O2.

5. Loosely seal the vessel to allow release of pressure.

6. Cap the vessel at the recommended pressure and place in the microwave. Run the program set up for this type of sample.

7. After the microwave heating is complete and the samples have cooled to room temperature, open the vessels and dilute the

sample to 50.0 ml. with D.I. water and transfer to a clean 2 oz. plastic bottle. Any vessels that vented during the digestion will need to have the sample redigested and either use less sample or a longer ramp at the lower temperatures.

Notes:

1. Different sample types will require different heating programs to prevent losses due to exceeding the maximum vessel pressure.

2. To keep the same sample dilution, as little as 0.25 g of sample can be weighed and diluted to a final volume of 25.0 ml. using 1/2 of the HNO3 and H2O2.

3. This digestion can be used for Flame AA, HGA, CV, and ICP.

4. If Mercury is to be run, remove a 10 ml aliquot immediately after dilution and place in a plastic tube and add 100 microliters of concentrated Trace Metal grade Hydrochloric Acid.

Method Code: 018

LABORATORY: Laboratory and Environmental Testing, Inc.

ICP on Perkin-Elmer 4300 DV

Make sure the instrument, Chiller, Air compressor, and gases are on, and at the proper temperatures and pressures. Turn on the computer and double click on the WinLAb32 icon.

Prepare standards and check samples to match the acid matrix of the samples to be analyzed. Change the pump tubing.

Click on "file", then "Open", and then "Method". Click on the method to be used and then click "OK", TO start the ICP program and call up the Method with the elements to be determined.

Click on the Plasma icon, and click on pump to start the pump and make sure the tubes are in the pump properly. Start the plasma by clicking the "On" icon. Click on the X in the upper right corner to close the Plasma Control. Allow the instrument to warm-up while the samples and standards are loaded into the auto-sampler racks. If the Sample Info table was not filled out previously, then fill in the sample information and save the table using the Batch ID.

Before starting the run, check the Hg wavelength by clicking on "Tools", and then "Spectrometer Control". Click on Hg Realign. When that is complete, aspirate a 10.0 Mn Standard and click on "Align View". After Align View is completed, close the box.

When ready to start analysis, click on the "Auto" icon, make sure that the data is being stored in a file with the correct name for the Batch, and that the right method is being used. Click the "Analyze" icon and click on "Analyze All".

When the run is completed, click on "File", then "Utilities", then "Data Manager". Highlight the file, and then click on "Export" icon. Click "Use Existing Design". Click "Browse" and choose the appropriate template (usually LET-ICP). Click "Open", place a disk in the "A" drive, and click "Finish". Click on "Export Data" to transfer data to disk in Drive "A".

Transfer data to the main computer and calculate the final Concentrations.